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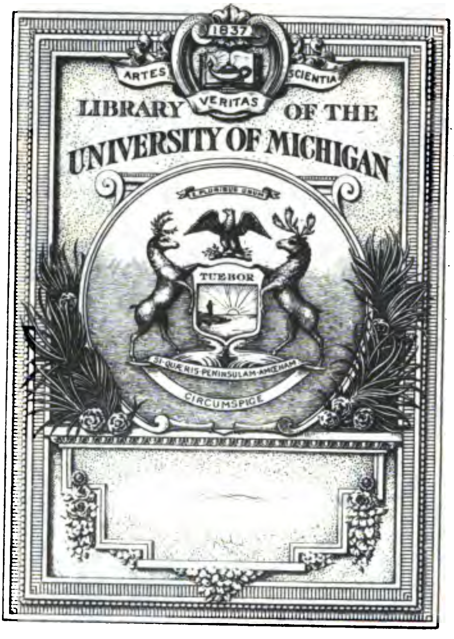

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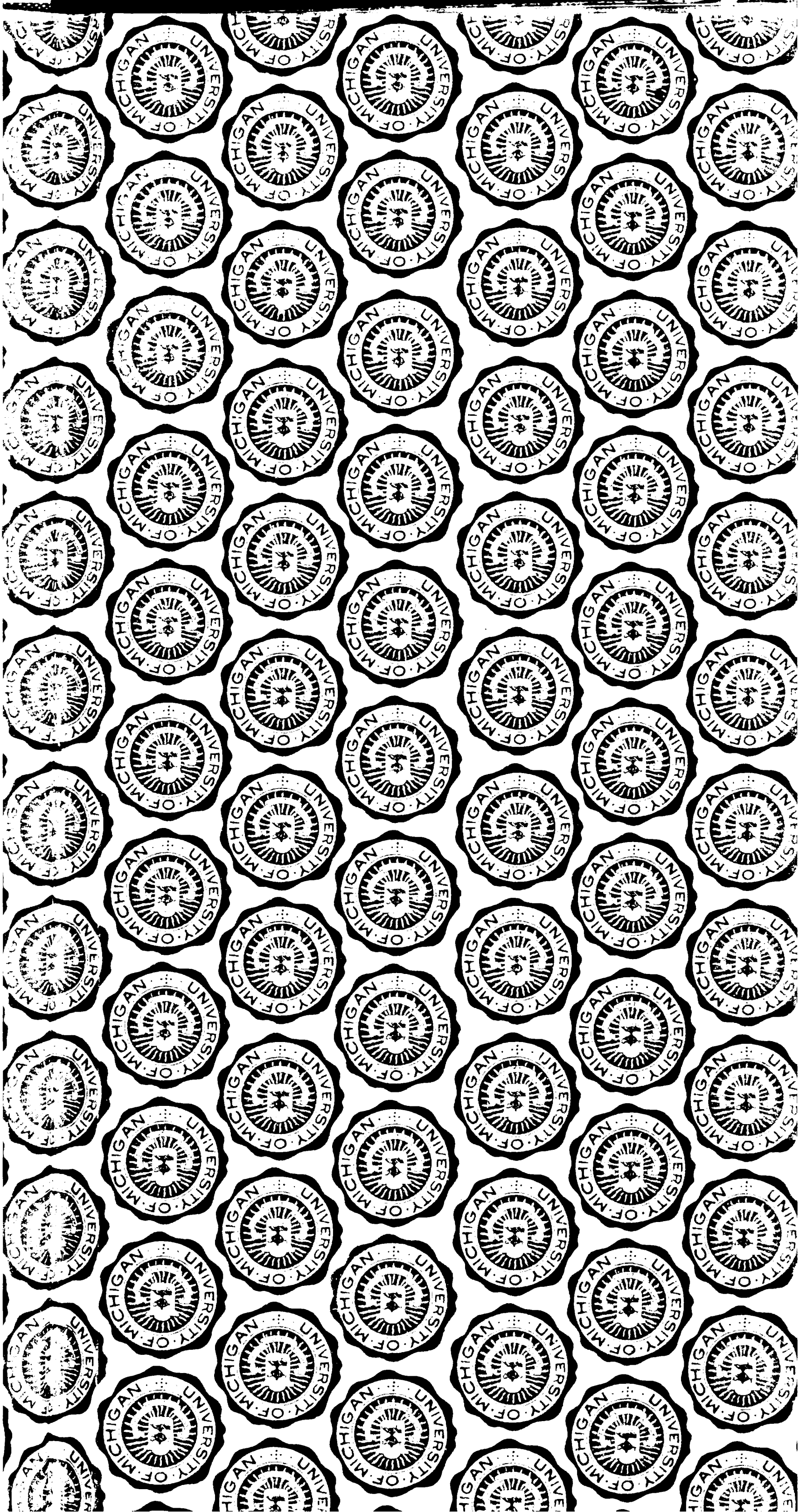
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graphical with notices of its natu
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PRODROMUS

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PRODROMUS
FAUNÆ ZEYLANICÆ;

BEING

CONTRIBUTIONS TO THE ZOOLOGY

OF

CEYLON.

BY

Edward Frederic

E. F. KELAART, M. D. Edin., F. L. S., F. G. S.

STAFF SURGEON TO THE FORCES.
MEMBER OF THE ROYAL COLLEGE OF SURGEONS, LONDON.
FELLOW OF THE ROYAL BOTANICAL AND PHYSICAL SOCIETIES OF
EDINBURGH, CORRESPONDING MEMBER OF THE ZOOLOGICAL SOCIETY OF LONDON, ETC. ETC.

> "Nihil est aliud magnum quam multa minuta."

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TO

ANDREW SMITH, ESQ. M. D., F. Z. S. &c.

INSPECTOR GENERAL OF HOSPITALS;

SUPERINTENDENT OF THE ARMY MEDICAL DEPARTMENT:

IN WARM ADMIRATION

OF HIS UNCEASING AND SUCCESSFUL EFFORTS

TO SUPPORT AND IMPROVE

THE BEST INTERESTS

OF THE

MEDICAL DEPARTMENT OF THE BRITISH ARMY;

AND

TO ENCOURAGE AND DIFFUSE ZOOLOGICAL KNOWLEDGE:

THIS VOLUME

Is most respectfully dedicated;

BY

THE AUTHOR.

PREFACE.

In presenting to my friends and to the public this work on the Fauna of Ceylon, I feel it scarcely necessary to make any apology for the imperfect form in which it is produced, since the work does not profess to be any more than a PRODROMUS, or BEGINNING. A Fauna so extensive and so little known as that of this Island, requires more time and greater facilities for working it out, than can be said to be at the command of any Army Medical Officer serving in the Colony.

Perhaps it may be urged by some, that the publication of a work of this kind might have been delayed with advantage for some years. This course I should myself have preferred, had not the probabilities of a removal to another station daily increased. Therefore, at the request of many kind friends, and from my own desire of putting them in possession of the materials collected during two years, in various parts of the Island, I now venture to lay before an enquiring, and it is to be hoped a generous public, the labours of my leisure hours.

At first, it was my intention to issue merely a text book on Ceylon Mammals for the use of Ceylonese, but finding that a more extensive work would be more generally useful, I have embodied in this book all that I could with safety put into the hands of the public, without much fear of giving any other than a correct account of the Zoology of the Island, as far as my own researches have extended.

Although I can date my knowledge of Ceylon animals from a very early period of my life, still, it was not till my return to the Island in August 1849, after an absence of many years, that I began to collect the new materials found in this work. Requested by Sir James M'Grigor, the late worthy Head of the Army Medical Department, and Dr. Andrew Smith, the present Superintendent, to pay some attention to the Natural History of Ceylon, I felt that I could not employ my leisure hours on a worthier object, or in a more interesting pursuit, than the study of the Fauna of my native country. Doctors, like men of every other profession, require some relaxation or recreation; and in the pursuit of Natural History, even under difficulties, they have one equal, if not superior, to any other mode of relieving their minds from the contemplation of the miseries to which flesh is heir. At all events, no occupation, save the one of giving relief to human suffering, have I found more congenial to my own mind than the study of Natural History. Those who are inclined to differ from me in this respect, I beg most earnestly to refer to the following favorable opinion of such a study rather than to any founded on my own experience, which can be conveyed but in poor language, compared with that employed by the author of "A Naturalist's sojourn in Jamaica."

"I can echo" says Mr. Gosse "with fullest truth the experience of Bishop Heber. 'In every ride I have taken, and in every wilderness in which my tent has been pitched, I have found enough to keep my mind from sinking into the langour and the apathy which have been regarded as natural to a tropical climate.' Nay, I may truly say, I found no tendency to apathy or ennui; every excursion presented something to admire; every day had its novelty; the morning was always pregnant with eager expectation; the evening invariably brought subjects of interest fresh and new; and the days were only too short for enjoyment. They were not days of stirring adventure, of dangerous conflicts with man or beast, of hair-breadth escapes in flood or field; their delights were calm and peaceful, I trust not unholy, nor unbecoming the character of a Christian, who has his heart in heaven, and who traces, even on earth's loveliest scenes, the mark of the spoiler. The sentiments expressed by my friend and fellow labourer are those which I would ever associate with the study of science. 'If the sight of nature' observes Mr. Hill, 'were merely the looking at a painted pageantry, or at a spectacle filling the carnal mind with wonder and delight, the spirit would be overpowered and worked into weariness, but it is the admiration at the wisdom, and reverence for the beneficence of Almighty power. He who dwelleth in the light which no man can approach unto, whom no man hath seen, or can see, is yet visible in his perfections through the works of his hand, and his designs are made manifest in the purpose of his creatures. Wherever our lot is cast, into whatever scenes our wayward impulses lead us, the mind-illumined eye gazes on divine things, and the spirit-stirred heart feels its pulses bounding with emotions from the touch of an ever present Deity. The habit that sees in every object the wisdom and the goodness as well as the power of God, I may speak of, as Coleridge speaks of the poetical spirit, ' It has been to me an exceeding great reward; it has soothed my afflictions; it has multiplied and refined my enjoyments; it has endeared my solitude; and it has given me the habit of wishing to discover the good and the beautiful in all that meets and surrounds me."

Although, I may have reason to be satisfied with the fruits of my labours, still there are so many parts of Ceylon which I have not visited, and of which so little is known to the Naturalist, that I would fain hope that at some future period I may be permitted to extend my researches to those parts, or that some competent person will sooner or later explore the *terra incognita.*

To enable the Ceylon Student of Zoology to study at least one department of the Natural History of the Island in a complete form, I have added the generic characters of mammals from the best authors. The specific characters are chiefly drawn from fresh specimens obtained since my return to Ceylon The remarks which follow each description of species will bring the student down to the latest knowledge we have of the characters of these animals, and also inform him of the opinions of those Naturalists who are at this moment engaged in similar researches on the Peninsula of India.

The second part of the Prodromus contains a summary account of the chief features of the Ornithology of the Island, and a catalogue of the Birds I have collected or observed, to which are added from the authority of Mr Blyth names of other birds known to exist in Ceylon.

I must not omit here acknowledging, with filial gratitude, the great interest taken by my late father in my Zoological studies. The various collections of Ceylon birds, which he from time to time forwarded to England, enabled me to become scientifically acquainted with the feathered race of my native country, long before my return to the Island.

From want of books of reference, I am unable to enumerate all the Ophidian Reptiles collected. Mr. Gray's descriptive catalogue of the Saurian Reptiles has enabled me to identify with very few exceptions this tribe of reptiles. Descriptions of them are given in the third part of this book. To Dr. Cantor's published account of the Reptiles of the Malayan Peninsula, I had also frequent occasion to refer for valuable information. The imperfections of this part of the Prodromus will soon be removed by Dr. Andrew Smith, who is extending his researches to the Erpetology of Ceylon. In the Appendix will be found such additional matters on Ceylon Natural History as I doubt not will prove very acceptable.

As an Introduction to the Zoology of Ceylon, I have given in an introductory form an account of the Natural History of perhaps the most important zoological station in the Island, viz. Newera-Ellia. The physical history of the maritime provinces is so well known that I have only drawn a general sketch of it.

Of late years the Zoology of India has engaged the attention of very active naturalists. Among them we find foremost, Colonel Sykes, Mr. Hodgson of the H. E. I. C. Civil Service, Mr. Walter Elliot of Madras, Mr. Edward Blyth, Dr. Jerdon and Captain Tickell. In Ceylon, Dr. Templeton has paid considerable attention to the Entomology of the Island. The birds also which he collected have all been identified by Mr. Blyth, and many new species described from that collection. Mr. Edgar Layard, brother of Mr. Layard of Nineveh celebrity, has also for several years contributed largely to the Zoology of the Island, particularly to its Ornithology and Conchology. Since my return to Ceylon I have been in constant correspondence with Mr. Layard, but it was not till very recently that I had the good fortune to meet him. I doubt not that the arrangement we have mutually entered into for future operations will, if allowed to be carried out, enable us in time to be more useful to each other than we have hitherto been. It is only by co-operation with such industrious Zoologists as Mr. Layard, that we can ever expect to work out the Fauna of Ceylon.

I cannot close these prefatory remarks without acknowledging the numerous obligations I am under to many friends, for the cheerful and valuable assistance received from them in the progress of my labours. With some a pleasing intimacy has also been established entirely by correspondence. Soon after these researches were commenced I communicated with Mr. Blyth and Mr. Walter Elliot, and latterly I have also had the pleasure of corresponding with Dr. Jerdon and Dr. Cantor, men distinguished for their researches in Indian Zoology. The difficulties I had to encounter have been considerably lessened by their assistance, more particularly by the aid given by Mr. Blyth, who has been very fortunate in obtaining specimens from Ceylon from several collectors. The encouragement such men give me to prosecute the work I have begun, is a further inducement to publish some connected account of those parts of the Fauna of the Island to which I have paid most attention. Their liberality, kindness and attention were indeed a happy contrast to the coldness and indifference of others, from whom one might have naturally expected at least facilities for working.

I also take this opportunity of returning my best thanks to Mr Edgar Layard, Messrs. Palliser of Dimboola, Mr. Simon Casie Chitty of Chilaw and Mr. T. A. Pieres of Kandy, for the numerous specimens they have from time to time favoured me with. I have also received valuable specimens and information from Mr. Pett, Ordnance Department, Trincomalie, and my brother Charles Kelaart of Kaduganava. My sincere thanks are also due, for specimens received, to Lady Torrington, Mrs. Warrington, Miss Tranchell, Mrs. Hall and Miss Barbara Layard, and to Major Brunker, Rev.Mr. Glennie, Rev. W. Wise, Captain De Montenach, The Honble Mr. Templer, Mr. W. H. Whiting, Mr. T. Tranchell, Mr. Kriekenbeek of Batticaloa, Mr. Marcus of Kurnegalle, Mr. J. B. Raux, Mr. G. F. Nell of Colombo, Mr. J. Bayly of Trincomalie, Messrs.

Baker of Newera-Ellia, Lieut. Waters C. R. R., Drs. Dobson, Cameron and Lamprey, the Wanniah of Tamblegam, the Chief Modliar of Trincomalie, and to Messrs. Wambeck, Anthonisz, Tap, Misso, Jansen, Ebert, and Gill, Members of the Colonial Medical Department, as also to Joanis Appoo Hamy, the *Taxidermist* of the Army Medical Officers' Museum.

In conclusion I have to thank the Conductors of the Observer Press, for bringing out in so creditable a shape this first zoological work that has been issued from the Colonial Press. The typographical errors are perhaps too numerous, but when the reader learns that many miles separated the Author from the Printer, he will, I feel assured, readily excuse this imperfection.

E. F. K.

Fort Frederick, Trincomalie,
1*st August,* 1852.

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THE NATURAL HISTORY

OF

NEWERA-ELLIA.

(GEOLOGY, METEOROLOGY AND ZOOLOGY.)

The various geological accounts of the Island, with the exception of the late Dr. Gardner's, are evidently derived from the writings of Dr. Davy, (brother of Sir Humphrey Davy), who, when employed in Ceylon, as an Assistant Surgeon to the Forces, had peculiar opportunities afforded him by General Brownrigg for investigating the Natural History of the Island.

The only new feature added to the Geology of Ceylon since Dr. Davy published his work in 1818, is the mention of the gradual rise of the western coast of the Island, which was first observed by the Revd. Dr. McVicar at Mount Lavinia, and since corroborated by Dr. Gardner from observations in other parts of the Island. The cutting of the new canal through the cinnamon gardens to the sea gives a very favorable opportunity of observing how recently, in a geological view, the whole of the Coast of Colombo must have been the bed of the sea. At Trincomalie also we have observed several indications of ancient sea beaches.

The only other interesting addition to the physical history of the Island is one which we think might safely be allowed, viz, the existence of limestones of the cretaceous system in the northern parts of the Island. The fossiliferous limestone found near Jaffna has the closest resemblance to the limestone from Trichinopoly and Pondicherry.

Many of the fossil shells found at Jaffna, appear to be similar to some of the species found at Pondicherry, and described by Professor Edward Forbes in the Transactions of the Geological Society of London.

The limestone in which the Ceylon fossils are imbedded is of a very compact and pure form. In one hand specimen we observed a fossil phalange, about an inch in length, apparently of a large saurian reptile. This unique specimen is now in the Museum of the Asiatic Society of Ceylon. We regret exceedingly that although only 100 miles from Jaffna, we have not been able to visit that district where there are so many interesting objects to attract the attention of the Naturalist. To Mr. J. N. Mooyaart we are indebted for some good specimens of this fossil limestone, which we have forwarded to Dr. Hunter of Madras and Professor Ed. Forbes, who will doubtless be able to throw more light on the age of this formation. Our own impression is, that it belongs to the Cretaceous system, though not, perhaps, identical with the formations on the opposite Coast of Southern India.

Supposing that these fossiliferous beds of limestone are of cretaceous, or of tertiary origin, it follows that they were deposited long after the mountains of Ceylon were elevated, for not a vestige of any such formation is found in any mountain range. Of this, however, we cannot be sure, since we have lately *heard* of "Chalk from Adam's Peak."

Dr. Davy crossed the plains of Newera Ellia in 1817 on his way to Fort MacDonald; but these mountain heights being then only traversed by jungle footpaths, it was not possible for even this acute observer to describe the geological features of this alpine district over-grown with thick forest and inhabited only by wild animals. Therefore, we have drawn up the following geological account of Newera

Ellia, with a view of satisfying the curiosity of our geological friends, and at the same time enabling them to make comparisons between the Geology of the Neilgherries and Newera Ellia.

Before the geology of Newera Ellia is considered, it is necessary to bear in mind that Indian Geologists are inclined to believe, that the mountains of Ceylon have been elevated about the same period as the Eastern Ghauts on the Peninsula of India; probably, too, by a contemporaneous effort of nature; and although there is between these two ranges of hills a wide break of continuity, they all appear to have a southerly direction.

The position and elevation of the mountain chains of Ceylon shew, that they were formed like the Western and Eastern Ghauts, by a succession of upheavals; and at periods which may be considered the plutonic, or before more recent formations covered the plutonic rocks and hypogene schists which form the mountains of the Island. As yet, with the exception of argillaceous, arenaceous, and siliceous schists, and occasionally Dolomite and fluviatile deposits, no other formations have been observed to cover the rocky heights: nor even are there any broken fragments of such rocks to be seen any where in the mountainous districts. The secondary or tertiary formations found on the Coasts of Ceylon must have been deposited long after the mountains of Ceylon were raised from the depths of the Ocean. From the geological characters of Newera Ellia and its neighbourhood, we infer that the greatest and most recent internal force employed in elevating the mountains of the Island, was applied in raising those which rise from the table lands in this district.

Newera-Ellia is nearly 6,210 feet above the level of the sea.

It is difficult to say to which of the Kandian provinces it belongs, one portion lying on the side of Dimboola one in the direction of Ouva, and the other in the district of Maturatta; for our purpose, however, this uncertainty is a matter of no importance, since the boundaries of the various provinces are more frequently artificial than natural. The steep ascent to Newera Ellia commences from the village of Rambodde, which is about 3,500 feet below the plains; the road winding round the sides of the mountains rises at an average one foot in twenty. From the top of Pedrotallagalla, the loftiest mountain in Ceylon, and which rises at the back of the plain to a height of 2,080 feet, the true features of this table land may be seen to great advantage. Three grassy plains are discovered extending around the base of the hill, and beyond these are several others of various dimensions.

Newera Ellia is generally considered to include within its province three plains viz, The large plain, the smaller or barrack plain, and the third or moon plain; from various, parts of which rise detached hills and clusters of hills, some of which are wooded on the top up to their summit, whilst others are wholly bare of trees. The wooded hills rise from 100 to 300 feet above the plains, forming boundaries to them. The bare hills, on the contrary, covered with coarse grass, rise only to a height of from 15 to 60 feet, and have rounded or domed tops, which present the appearance of so many reversed tea cups on a tray. These run in various directions, and not unfrequently converge towards the plains. They appear to have been elevated subsequently to the wooded hills, which nearly all have their direction from East to West. The large plain, at the northern extremity of which is the bazaar, and on its side houses inhabited by Europeans, is of an irregular elliptical shape, its major diameter being about 2½ miles, running from N. N. W. to S. E:—the lower portion of this plain is nearly level. The upper division is watered by a narrow, stream, which after taking its rise on the heights of Pedrotallagala, and traversing two thirds of the plain, finds its way through a gully in the western side, and pours down into the valley of Dimboola and there forms one of the largest tributaries of the Mahavilla-ganga. The second plain, on which the military buildings are situated, has more the character of a valley than that of a plateau, being walled in as it were, on either side by a high range of wooded hills. Through its lower portion runs a narrow stream, (bounded by the hills above), which ultimately finds its way into the country near Fort MacDonald. The third or Moon plain, so called from the quantity of moon stones found in the gravelly deposits below the dark loam, is of an orbicular form, and is about one third the size of the large plain. The circuit including the three plains and hills, which separate them, is about 8 miles; the circumference of the large plain being about 5 miles, that of the Barrack plain being about 1½ mile, while, that of the Moon plain is probably two miles. From the top of Pedrotallagala are seen other plains similar in their nature to those of Newera Ellia, but of higher and lower elevations, and of various superficial dimensions. It is not altogether imaginative to suppose that all these plains, which are seen in succession in one coup d'oeil, form with the intervening hills a large mountain plateau, or table land, ranging from 6,000 to 7,000 feet in height. In this view of the surrounding country the distant patnas or plains look like so many bright green oases in a dark, rocky, wild country. It was from the top of Pedrotallagala, that a small party of Officers first observed the plateau of land called Horton plain. This plain is about 800 feet higher than Newera Ellia, and far more extensive. In a direct line, Horton plain is probably not more than 10 or 12 miles distant from Newera Ellia, but the path leading to it winding round hills, and following the courses of valleys, makes the journey some 20 miles long; and a most fatiguing one it is. Four miles before the plain is reached, the top of the mountain called Tottapella has to be climbed by a rocky ascent of nearly 1,000 feet. After descending this high hill for a few hundred feet, the immense patna known as Horton plain is soon reached. The labour and fatigue of the journey is amply compensated by the magnificent scenery now displayed exceeding the most ardent hopes of the tourist. Horton plain being the highest table land in Ceylon, gives one the opportunity of seeing the vast extent of the mountains and valleys of the interior of the Island, spreading from its heights, as it were from a centre. From the eastern side are seen the barren dome-shaped mountains of Ouva. From the south east may be discovered on a clear day, Hambantotte and its Salt Lakes. On the west of Horton plain lies the magnificent country of Dimboola, on which some of the finest Coffee Estates are situated, at elevations between 4 and 5,000 feet. From the valley of Dimboola rises to the height of about 1,800 feet a peaked hill called the Great Western. Between Dimboola and Horton plain is seen the Boopatalawa plain or patna, which is nearly as large as Horton plain. A pathway leads from Horton plain, along a beautiful valley and a wide running stream, into Saffragam. Before this country is reached the tourist looks down a precipice of nearly two thousand feet deep, into the lower land of Saffragam with the heights of Adam's peak towering over it in majestic grandeur. At the foot of this precipitous descent is a small village called Galla-gamma, through which runs the river flowing from Horton plain.

Besides the mountain called Totta-pella, which the tourist has to ascend before he can reach Horton plain, there is also in its vicinity another high range of hills, the highest peak of which is named Kereigal-potta;—it is 7,810 feet high.

Having described the external characters of the table lands of Newera Ellia and its vicinity, I shall attempt a description of the geological characters of the rocks, earths and clays forming them.

The softer members of the hypogene schists found in other parts of the Island, such as micose and talcose schists appear to have been decomposed and washed away from the harder rocks, their debris is occasionally met with at the base of the hills, or mixed with the gravelly deposits on the plains.

The hard rocks, whose inequalities have been softened down in many parts by the erosive effects of decomposition, consist of several forms of gneiss. Quartzite and pegmatite also seem to have once abounded in this district. They are now only occasionally met with capping gneissic hills. The gneiss is chiefly of the felspatic kind, in which felspar and quartz predominate, the former in greater proportion than the latter. This gneiss is frequently garnetiferous:—whole mountain masses are seen studded closely with minute crystals of garnet. In some of the gneiss scales of graphite are found. The other common form of gneiss is of a more granitic variety in which hornblende completely replaces mica; this variety may be called Syenitic-gneiss. Between layers of this kind of gneiss are found intervening strata of quartz and sometimes pure felspar. Felspar decomposing very readily, forms the white or porcelain clay, called Kaolin, used as a substitute for lime for whitewashing walls of houses and for other purposes when lime cannot be procured. Pure hornblende rock or schist is not found in this locality.

Dip and *Direction*. The strata of gneiss are not seen here to be so violently contorted; nor are there so many abrupt breaks of continuity in the gneiss, as are to be seen in other parts of the Kandian Provinces. The beds are sometimes found lying horizontally. Usually the Dip is westerly at angles of position from 15° to 80,° generally about 30°. A few miles beyond Rambodde, near the village called Bambregahar, is a conspicuous flat topped mountain peak rising fully 500 feet above the road, in which, the strata of gneiss lie perfectly horizontal; the whole heap looking as if it were raised from its ocean bed with the greatest care. This horizontal position is more or less the same over the mountains in that neighbourhood. The gneiss forming one of these rocks appears to be of a more granitic character; the crystals are larger and not arranged so completely as in the other varieties; hornblende is seen in distant layers or loosely cohering to crystals of quartz and felspar. It is also studded with small crystals of Garnet. Four miles beyond Newera Ellia, on the road to Badulla, the gneiss is covered with Magnesian limestone,—the Dolomite so well described by Dr. Davy, who it appears was the first European that crossed the patnas of Newera Ellia. This limestone is also found in Badulla on the borders of rivers, and is also found in similar positions in Dimboola. At Pusilawa on the road to Kandy, the Dolomite in one place is covered over with decomposed micaceous schist. The limestone found in the vicinity of Newera Ellia is exposed and its surface blackened. There are two varieties, a white and grey; both are crystalline: the white variety is prefered as it contains less of the phosphate of lime (Apatite) and carbonate of Magnesia. Hexagonal crystals and minute scales of mica are also found in this Dolomite.

The minerals found in the beds of mountain streams are chiefly rubies, garnets, and sapphires. Adularia and Ceylonite are found in the gravelly beds on the plains, particularly moonstones, in the moon plain, where the gravel is composed of rounded and angular pieces of quartz. Iron pyrites, magnetic and hematitic ores of iron are abundant in this district. Long before Europeans visited Newera-Ellia, the natives used to come up to smelt iron from the ferriferous rocks found here. Gold is also said to have been discovered here. Iron glance is found in some of the gneiss, forming almost unmixed layers between the other strata, but more frequently seen disseminated throughout the rock. The chief characteristic difference between the plutonic rocks and hypogene schists of the Malayan Peninsula and those of Ceylon and the Peninsula of India, is the titaniferous and the cupriferous characters of the former and the wholly ferriferous nature of the latter. So deeply impregnated are the rocks of Ceylon with oxides of iron, that their decompositions take the colour which the oxides give, which are not in the same proportion in every part of the rock; hence arises that variegated appearance of colours in the decomposed masses of these rocks forming Lateritic and Lithomargic hills. Even the crystals of garnet are so saturated with iron that they, too, decompose with the matrix in which they are embedded.

The clays found in Newera Ellia and its neighbourhood, have hitherto been considered and described as deposits, but after some months of observation, we have come to the conclusion that they are formed of decomposed masses of gneissic rocks *in situ*. Nature is here detected in the very act of decomposition; various stages of it are seen in the same mountain masses. There are also hills so completely decomposed, that they can be cut through with a knife. In these Lithomargic hills are seen boulder-looking pieces of undecomposed gneiss, which from some cause or other have been left untouched by the decomposing agency employed in the neighbouring parts of the rock. Some of these solitary blocks of various sizes and dimensions are now undergoing that process of spontaneous concentric exfoliation called *Maladie de Granite*. In a paper read before the Asiatic Society of Ceylon, we have described fully the nature of the disintegration and decomposition of the hypogene rocks of the Island. The gravel and black loam of the patnas, or plains of Newera Ellia are evidently deposits of either a lake or broad slow winding river. The gravel consists of rolled and angular pieces of gneiss and quartz. In the moon plain nearly all the quartz pebbles found under the black soil are rounded like marble, and in such beds are Moonstones found. The black loam is always seen lying over these gravelly beds of various thicknesses. This arrangement of gravel and loam (or mud) is also seen in Horton plain and other patnas in this district.

CLIMATE, METEOROLOGY, &c.

The climate of Newera Ellia, though delightful to the feelings of Europeans after a long residence in warm parts of the Island, where the mean temparature is 80° F, has little pretension to be considered English. To borrow the idea of an Englishman on this subject we have to remark that the dewy softness of morning and evening in the British Isles is scarcely known here. When it does not rain, or when the sky is unclouded the rays of the sun are hot and glaring, at the same time that a dry piercing breeze blows. The mornings and evenings, at least in clear weather, are intensely cold. At such times, a copious deposition of dew takes place in the latter part of the day, which long before midnight is converted into hoar frost. Mr. Cavet, late Asst. Surgeon of H. M's. 97th Regt, writing in 1835 of the climate of Newera Ellia, observes "that one is either parched with drought, deluged with rain, or enveloped in clouds and mists." This is precisely what we too have remarked in 1850.

The year may be divided into two seasons, viz. the dry and the wet: the former generally prevailing from January to April, and the latter from May to December. The

Maximum temperature observed by us from January to June was 76° F. and the Minimum 36° F. Ice half an inch in thickness is occasionally found in very cold mornings in shallow pools, and in basins of water left in the open air during the night.

We have much pleasure in having this favourable opportunity of recording here, the Meteorological researches of our esteemed and valued friend Mr. Cavet, which originally formed part of the Annual Report to the Director General of the Army Medical Department, and which he some years since placed at our disposal.

Mr. Cavet's Meteorological Notes on Newera-Ellia.

The residents of Newera-Ellia divide the year into the wet and dry seasons, the former corresponding to the prevalence of the S. W. the latter of the N. E. monsoon. The distinction is far from absolute, as much rain occasionally falls during the dry season, and there are portions of fine dry weather during the wet, but there is a sufficiently marked difference of character in the two periods to justify its general use.

The acquaintance of the writer with the station extending only over a period of ten months, his observations on its climate are very limited, and do not allow him to make any attempt at a general description of its peculiarities.

The N. E. monsoon prevailed from the beginning of the year till the end of April. The direction of this wind varied in one direction to the East, or even to the southward of East, and in the other to the North or a little to the Westward. Sometimes, particularly after sun-set, a light breeze blew directly from the West, in a direction almost exactly opposite to that which had prevailed during the day. This latter breeze I do not, however, look upon as arising from any variation in the direction of the prevailing monsoon, and I would offer the following explanation of its occurrence.

During the dry season the sky is for the most part cloudless, but at times cirri or cirri-cumuli are observed in the moon-light, floating along at a considerable elevation. Their direction is from west to east, and they would appear to be borne along by the retrograde superior current of air, arising from the accumulation resulting from the N. E. and inferior current. The elevation of the station, more than 6000 feet, may be supposed to be nearly that of the lower aerial current, from the direction of which the monsoon derives its name. This must vary in depth at different times, and hence it will occasionally happen that when the sun has set, and the lower strata are further reduced in thickness by the condensation produced by the cold of night, the upper surface of the N. E. current will be depressed below the level of the station, which, in consequence, will be then situated in the superior and returning current. During the wet season and prevalence of the S. W. monsoon a phenomenon admitting of a similar explanation is at times observed in the occurrence after sunset of a gentle breeze coming from the east.

The greatest degree of cold and consequently the greatest thermometric ranges, occurred during the dry season; thus, the range of February 37° F. is nearly double of that of September 19° F., and the greatest cold of the former 34° F. is much below the minimum of the latter 49° F. The former was the lowest temparature observed by a self-registering instrument during the period; and considering that ice is formed at times during the dry season a lower temperature would be expected.

The cold necessary for the freezing of water would appear, however, to take place only on the surface of the ground and in exposed situations, where it might be looked for in clear nights according to the established laws of the radiation of heat. Thus on the 14th February at 10 P. M. a thermometer under a Verandah 6½ feet from the ground, stood at 52° F., a second on the ground uncovered at 45° F. and a third close by the side of the second but covered with a screen at 51° F.; the sky at the time was slightly cloudy. The observation was repeated the following night at the same hour when the sky was clear; the first thermometer stood 50° F., the second at 40, 5° F., the third at 49, 5° F. The maximum effect produced here by radiation was 9° F. but it was observed at the same hour on another occasion to amount to 15° F. in a perfect calm, while with a clouded sky and fresh breeze it was not more than 2, 5° F. I cannot report any observations made before sun-rise, when from accumulation the effect would, most probably, be greater; but I believe that those stated will show, that the formation of ice in the latitude of 7° North, may be accounted for on known principles, without the necessity of supposing as one of my predecessors had done, that water freezes there at higher than the usual temperature.

The visible effects of cold in a fine clear evening during the dry season are eminently beautiful. The valley is a basin with an uneven bottom surrounded by a mountain barrier, varying in height from one to two thousand feet. One of the most elevated portions of this boundary is to the west, so that long before the sun sinks under the level of the actual horizon his rays have ceased to illuminate the surface of the valley. By the time they begin to fade from the summits of the opposite mountain range, a thin layer of vapour has formed over the surface of every piece of perfectly still-water. These gradually elevate and expand themselves, becoming at the same time denser, till they finally coalesce and fill the basin to a variable height, with a stratum of thick white vapour. This attains its greatest depth soon after dark, and shortly after begins to subside: I have seen it entirely gone by 10 P. M. when the grass was covered with hoar-frost.

During May the wind which at first blew from the North and Westward, gradually veered to the South, and by the end of the month was fixed at S. W. and blowing fresh. In this month the complete change of direction between the day and night was observed on several days, and on each of these occasions was accompanied with rain. In June this monsoon blew with much force and a good deal of rain fell. In July it was more moderate with much fine weather. During August its strength was greatest, often rising to a gale and continuing for days together with heavy and nearly uninterrupted rain, both generally increasing in violence after sunset, and abating towards morning. During September its direction was more unsteady and its force less; and in the beginning of October it was again veering to the West and Northward.

A very great difference of sensation is produced by the atmosphere in the two monsoons. In the N. E. the air always seems arid and parching; but in the S. W. the fine mornings have a softness that reminds one of the British Isles.

I have paid some attention to evaporation, and the few observations I made gave a difference of 7° to 9° as of ordinary occurrence in the dry season, and one or even 5° to 4° as common in the wet.

The following table exhibits the principal meteorological circumstances of the first 9 months in the year. It is there seen that only one month has attained the mean temperature of 60° F., and that rain to the amount of 61,36 inches fell on 169 days out of 273.

METEOROLOGICAL TABLE. Newera-Ellia, Ceylon, N. L. 7. 5°. Long. 80-49° *E. Elevation* 6210 *feet.—From* 1*st January to* 30*th September* 1835.

MONTH.	TEMPERATURE.			FARENH.			RAIN. INCHES.			WINDS.
1835.	Max.	Min.	Range.	Max. range in 24 hours.	Min. range in 24 hours.	Monthly Mean.	No. of days.	Quantity. Inches.	Max. in 24 hours.	Prevailing direction.
January	71°	36°	35°	35°	4°	55.9°	11	10.03	2.40	S. E. & E.
February........	71°	34°	37°	32°	7°	58°	8	.88	.43	E. to N. E. & S. E.
March	74°	38°	36°	34°	7°	59.7°	17	3.38	.59	N. E.
April	71°	45°	26°	24°	14°	59°	22	9.68	2.78	Variable.
May.............	73°	44°	29°	27.9°	5°	60.1°	21	8.24	1.65	S. W. & W.
June	69°	47°	22°	21.5°	4°	59.2°	24	6.34	.75	S. W. & Westerly.
July............	71.5°	49°	22.5°	20°	5°	59.6°	19	1.90	.48	S. W. & Westerly.
August	73.5°	47°	26.5°	23°	3°	59.1°	23	13.92	2.68	S. W. & Variable.
September	68°	49°	19°	18.5°	6°	59°	27	6.99	1.42	S. W. & Westerly.

N. B.—The thermometrical observations were made with a self-registering thermometer.

Having given an account of the physical history of Newera Ellia, it may be expected that we should give an opinion respecting its climate as a Sanatarium. This we proceed to do with some hesitation, as our short residence there, does not entitle us to speak positively on a subject of such vital importance.

As a tropical station, Newera-Ellia is doubtless the healthiest part of the Island for Europeans. But the vicissitudes of temperature and the daily range of the thermometer, frequently as high as 35° F., preclude a recommendation of this climate for invalids suffering from serious organic lesions. The class of invalids who are likely to benefit from a residence on the hills, are those whose general health has heen impaired from a long residence in other parts of the Island, or convalescents from diseases contracted in the low country. Persons affected with pulmonary and rheumatic complaints cannot expect to derive any benefit from a residence in Newera-Ellia. On the contrary, their complaints are often aggravated from those causes noticed by Mr. Cavet in his Meteorological account of the station. We join Dr. Beatson, who resided there for a longer period, in remarking that the chief advantage of a temporary residence in Newera-Ellia is the prevention rather than the cure of diseases.

There are not, strictly speaking, any endemic diseases in Newera-Ellia. Slight cases of diarrhœa and dysentery sometimes occur, but not more frequently than in autumnal months of Northern Europe. This station has recently been visited by an epidemic of a gastric or intestinal disease, closely allied to painter's colic, which has in several instances proved fatal. It prevailed among the soldiers and permanent residents: visitors were exempted from it. Small pox has only once or twice been known to have visited the station since Europeans have settled there. The vaccine pox comes to great perfection in subjects vaccinated from lymph obtained from the low country.

The climate agrees remarkably well with children. The ruddy glow of health, is as apparent among them in this sanatarium as in children brought up in the more favoured climes of Europe. Adults too, who come up these hills with a pale or jaundiced complexion, acquire a fresh tinge by even a short residence, provided they are not suffering from such organic diseases as baffle all climes and medical treatment.

ZOOLOGY.

If the Botanist is struck with the different aspects of vegetable nature in the low lands and highlands of Ceylon, the Zoologist is not less so with the difference observed by him, in the distribution of species in the alpine parts of the Island and maritime provinces.

On approaching the plains of Newera-Ellia, the same degree of variety and beauty in the birds is not observed as in the feathered race of the low country. Many of them are species confined to the highest parts of the Island. Among these the Naturalist will remark the Ceylon representative of the English Blackbird, a new species which we have designated Merula Kinnisi. The tom-tit, Parus cinereus, the bulbul, Pycnonotus penicillatus, *n. b.* and the black robin or meadow chat, Pratincola atrata, *n. b.* are with the blackbirds, pipits and finches the commonest birds in these alpine plains. Out of fifty species of birds we collected during a residence of eight months, only half the number are birds common to the maritime provinces and the highlands. Very few are, however, strictly confined to elevations above 3500 feet, and these are, Merula Kinnisi, *n. s.*, Merula Wardii, Pycnonotus penicillatus, *n. s.*, Pratincola atrata, *n. s.*, Hypsipetes Neilgherries, Amadina pectoralis, *n. s.*, Spizaetus Nepalensis, Ephialtes sunia, Cuculus micropterus, Malacocercus rufescens, Garrulax cinereifrons, *n. s.*, Alcippe nigrifrons, Brachypteryx Palliseri, *n. s*, Hirundo domicola, Acanthylis caudacuta, Caprimulgus Kelaarti, *n. s. Blyth.*

Of species common at Newera-Ellia and on Kandian hills (from 1200 to 2000 feet elevation) are the following, Palæornis Calthropæ, Cissa puella, Gracula ptilogenys, Pomatorhinus melanurus, Cypselus melba, Palumbus Torringtonii *n. b.*, Corydalla striolata, Cisticola omalura.

The Mammals do not present such striking differences as the birds:—out of 89 species of mammals observed by us in the Island, only 29 are found in Newera-Ellia and its vicinity; of these 29 but five species are, as far as our present researches enable us to form an opinion, confined to the alpine parts of the Island, viz., Sciuropterus Layardi *n. b.* Sciurus trilineatus, *Waterhouse*, Sorex ferrugineus, *n. b.*, Feroculus macropus, *n. b.* (two new species of shrew), Golunda Newera *n. b.* (soil rat). There are four other species of mammals which have not been seen lower down than Kandy, viz., Presbytis ursinus, *n. s.* Sciurus Tennantii, *n. s.*, Sorex montanus, *n. s.* Mus Kandianus, *n. s.*

The most common mammals at Newera-Ellia are, Paradoxurus Zeylanicus, Felis Leopardus, Herpestes vitticollis, Viverricula Malaccensis, Canis aureus, Mus Kandianus and Lepus nigricollis.

The only Quadrumana seen in Newera-Ellia is Presbytis Ursinus, a new species of monkey founded by Mr. Blyth from a specimen we sent to the Museum of the Asiatic Society of Bengal. Of Bats we have observed only two species, viz. the common flying fox and the pigmy bat. The Chetah or Leopard is very common: instances have been known of the chetah coming into cultivated ground, and even into the village, carrying off a goat or a calf. The only other species of the genus Felis is the red-spotted cat (F. rubiginosa), size of a domestic cat, with a very short tail. The Indian Genette, or Civet cat of European residents, is very common. The streaked mongous, Herpestes vitticollis, (Badger of soldiers in Newera-Ellia) is found in great abundance. Herpestes fulvidens, *n. b*, a smaller species of yellow mongous, is rare; Paradoxurus Zeylanicus, a golden brown cat-like animal is very numerous. They are here larger and darker than those found in the maritime provinces. The Indian Otter, Lutra nair, is very rarely seen. The Jackal is, as in every other part of the Island, very common. It is generally larger and of a darker colour than that of the low country.

Three new species of Sorices are found in the plains. The little soil rats, Golunda Newera, are not very numerous; they are found in pairs in the black soil. Mus manei, the common house mouse, is sometimes seen in godowns. Mus Kandianus is the common house rat; it is the mountain variety of M. fulvescens of Elliot. The common brown rat, Mus decumanus, had not up to 1850 found its way up the hills, but it will not be long before this cosmopolite rodent becomes a denizen of the smoking cottages on the tropical sanatarium. The Bandicoot is very common on the plain. A species of Porcupine is also found. The other mammals found are hares, squirrels, flying squirrels, saumer deer, or Elk of Europeans in Ceylon, the Muntjac, or red deer of Ceylon sportsmen, and the Indian Meminna, or moose deer. Elephants and wild hogs are also very abundant.

Dr. Davy, the first naturalist who notices the plains of Newera-Ellia, attaches some importance to the fact of Elephants being found in the cold frosty climate of the alpine heights of Ceylon. "It tends" says Dr. Davy "to diminish the marvel of the occurrence of the bones of Elephants in the alluvial deposits of temperate climates," or in other words he thinks, that it is not necessary in accounting for the fossilized bones of Elephants and other animals of the present torrid fauna, to presuppose that the temperature of the colder parts of the world was higher when Elephants roamed in their forests. Be this as it may, Elephants seem to love the cold air of Newera-Ellia, as much as they do the heated jungles of the low country. Elephant plain, near

Newera-Ellia, obtains its name from the great abundance of this Pachyderm found there, nearly at all times of the year.

Of fishes only two small species are found.

Of Reptiles there are only a few species. Ceratophora Stoddartii is the common "needle nosed lizard" of the plain; there is also an allied new species. The green lizard, Calotes viridis, Gray, is also numerous. Calotes ophiamachus is rarely seen; a species of Goniodactylus (?) has also been observed.

The tree frog, Polypedates maculata, and two new species of frogs are also common. There are only two species of snakes,—both unidentified.

Of Insects, there are not many species, nor are they very numerous; among the unknown ones is the yellow glow worm which we have not met with elsewhere.

Of Land shells, we have observed only four species.

The following list of Animals, collected and observed by us in Newera-Ellia, will best explain to the Geographical Zoologist the characters of the Fauna of this locality.

MAMMALS.

Presbytis Ursinus, *Blyth.*
Pteropus Edwardsii, *Geoff.*
Scotophilus Coromandelicus, *F. Cuv.*
Leopardus varius, *Gray.*
Felis rubiginosa, *J. Geoff.*
Viverricula Malaccensis, *Horsf.*
Herpestes vitticollis, *Elliot.*
Herpestes fulvidens, *Nobis.*
Paradoxurus Zeylanicus, *Schreb.*
Lutra Nair *Sykes.*
Canis aureus, *Linn.*
Sorex montanus, *Nobis.*
Sorex ferrugineus, *Nobis.*
Feroculus macropus, *Nobis.*

Mus Bandicotta, *Beschst.*
Mus Kandianus, *Nobis.*
Mus Manei, *Gray.*
Golunda Newera, *Nobis.*
Hystrix leucurus?, *Sykes.*
Lepus nigricollis, *F. Cuv.*
Sciurus Tennantii, *Layard,*
Sciurus trilineatus, *Waterhouse.*
Pteromys Oral, *Tickell.*
Sciuropterus Layardi, *Nobis.*
Meminna Indica, *Gray.*
Muntjacus vaginalis, *Gray.*
Cervus hippelaphus, *Cuv.*
Elephas Indicus, *Linn.*
Sus Indicus?, *var, Gray.*

BIRDS.

Spizaetus Nepalensis, *Blyth.*
Tinnunculus Alaudarius, *Briss.*
Athene castanotus, *Blyth.*
Ephialtes sunia, *Hodgson.*
Caprimulgus Kelaartii, *Blyth.*
Cypselus melba, *Linn.*
Collacalia brevirostris, *Mc Clelland.*
Acanthylis caudacuta, *Lath.*
Hirundo domicola, *Jerdon.*
Harpactes fasciatus, *Lath.*
Halcyon Smyrnensis, *Linn.*
Merops Philippensis, *Linn.*
Dendrophila frontalis, *Horsf.*
Cisticola omalura, *Blyth.*
Parus cinereus, *Vieil.*
Zosterops annulosus, *Swains?*
Motacilla boarula, *Linn.*
Corydalla striolata, *Blyth.*

Brachypterix Palliseri, *Nobis.*
Alcippe nigrifrons, *Blyth.*
Merula Kinnisi, *Nobis.*
Merula Wardii, *Jerdon.*
Oreocincla spiloptera, *Blyth.*
Garrulax cinereifrons, *Blyth.*
Malacocercus striatus, *Swains.*
Malacocercus rufescens, *Blyth.*
Oriolus melanocephalus, *Linn.*
Pycnonotus penicillatus, *Nobis.*
Hemipus picatus, *Horsf.*
Hypsipetes Neilgheris, *Jerdon.*
Cryptolopha cinereocapilla. *Blyth.*
Stoporala melanops, *Blyth.*
Pericrocotus perigrinus, *Linn.*
Cissa puella, *Blyth* and *Layard.*
Corvus splendens, *Vieil.*
Gracula ptilogenys, *Blyth* and *Templeton.*
Acridotheris cristalloides, *Hodgson.*
Amadina pectoralis? *Jerdon.*
Palæornis Calthropæ, *Layard.*
Gecinus cholorophanes, *Blyth.*
Brachypternus Ceylonus, *Forster.*
Centropus Philippensis, *Cuv.*
Cuculus micropterus, *Gould.*
Palumbus Torringtonii, *nobis.*
Treron Malabarica, *Jerdon.*
Gallus Lafeyettei, *Lesson.*
Galloperdix bicalcaratus, *Blyth.*
Scolopax rusticola, *Linn.*
Gallinago Scolopacinus, *Bonap.*
Gallinago heterura, *Hodgson.*

REPTILES.

Ceratophora Stoddartii, *Gray.*

Calotes viridis, *Gray.*
Calotes Ophiamachus, *Gray.*
Salea Jerdonii ?, *Gray.*
Rana Newera-Ellia, *n. s. Nobis.*
Polypedates maculata, *Gray.*
Polypedates stellata, *n. s. Nobis.*

FISHES.

Two unidentified Species. ——

MOLLUSCA.

Four species, not identified.

While the late Dr. Gardner's botanical researches in Newera Ellia and the neighbouring heights and plains, apparently confirm his view that the highest mountains of Ceylon form a distinct centre of creation, we have not sufficient materials from the Fauna of the same district, to justify us in coming to any such conclusion with respect to the animal creation. Although we are inclined to lean towards Dr. Gardner's opinion from the few facts already collected, we should be premature in giving any decided opinion, till we had ascertained the principal features of the Fauna of the Neilgherries. In the mean time we may remark, that we have been informed that there is a great similarity in the two Fauna. However, there are a few animals in Newera Ellia, which as yet have not been observed in the Neilgherries or any other part of Southern India, namely, Presbytis Ursinus, Paradoxurus Zeylanicus, Sorex Montanus, Sorex Ferrugineus, Feroculus Macropus, Golunda Newara. The new species of Birds found in Newera Ellia may possibly be, after all, local varieties, such as Merula Kinnisi, Pratincola atrata, Caprimulgus Kelaarti, Pycnonotus penicillatus, &c. The two new species of frogs may be identical with the two new species found by Dr. Jerdon on the Neilgherries, viz. Rana Neilgherris, Polypedates variabilis. Till further researches are made in the distribution of species, it would be better to defer an opinion on the identity or non-identity of the Fauna of Neilgherries and Newera Ellia. But we regret exceedingly that since we left Newera Ellia, we have not been able to gain further information on the subject. It is to be hoped that some Zoologist will soon visit that interesting locality and complete the work which we have only begun.

To the botanist, Newera Ellia possesses a painful interest. It is there that the much lamented Gardner finished his earthly career. Science has lost in him one of her most devoted and talented sons. Had he lived longer, the fruits of his labour would have been ere now recorded in a work worthy of his name and the Flora of Ceylon. The only account we have seen on the general features of the Botany of the Island, is a short one drawn up by Dr. Gardner and published in Lee's Translation of Ribeiro's Ceylon; as this work is out of print, and as the Botany of the Island is so little known, we intend to reprint it in our Appendix, feeling assured that some light will be thrown by Dr. Gardner's labours on the origin and connection of the Flora and Fauna of Ceylon.

Dr. Andrew Smith, in his Report of the Expedition for exploring Central Africa, (of which he was the Superintendent and Naturalist), makes the following observation which we deem worthy of the attention of all field naturalists.

"There is, doubtless, a something besides either food or temperature which influences, nay, regulates, the distinction of animal forms; but what that may be, will appear more and more evident only as we get divested of the opinion, that we already know sufficient of the scheme of the Creator, to enable us to explain the manifold difficulties which it offers to our enquiry, by the assured aid of certain external agencies, which, in all probability, will eventually be found to have not even the most remote share in the occurrences."

"When countries shall have been carefully traversed, and the animal productions inhabiting them exclusively, or in common with other countries, minutely examined, both as relates to their physical characters and their habits, then the naturalist may be able to indicate principles which the great book of nature, and not simply the books of men will maintain and extend."

While we join Dr. Smith in appreciating the importance of the labours of Field Naturalists, we cannot affect with Mr. Gosse to depreciate the value of the laborious researches of the Cabinet Zoologists. In the ZOOLOGY OF SOUTHERN AFRICA and the BIRDS OF JAMAICA we have noble instances of what great service can be rendered to Science by a due combination of the two modes of operation,—the field and the closet. Our own labours would, like those of too many collectors, have been a chaotic mass, but for the assistance of the cabinet investigations of such eminent men as the Grays and Blyths. Would that we had more opportunities of consulting their works and extending under such auspices, our researches in the natural history of our native land.

PART I.

CEYLON MAMMALIA.

CEYLON MAMMALIA.

ORDER. QUADRUMANA.

FAM: SIMIADÆ.

GENUS. PRESBYTES. *Eschsholtz.*

Semnopithecus. *F. Cuv.*

An Asiatic genus of Monkeys, nearly allied to the Gibbons (Hylobates), with an additional tubercle to the last molar of the lower jaw. No cheek-pouches. Callosities distinct. Tail long. Limbs long and slender; arms reaching to the knees; anterior thumb very short. Stomach sacculated and divided into three compartments, viz. 1st, Cardiac pouch with smooth and simple parietes, slightly bifid at the extremity; 2nd, a middle very wide and sacculated portion; and 3rd, a narrow elongated canal, sacculated at the commencement, and of simple structure towards its termination. The latter division from its greater vascularity, and the more abundant distribution of the nerves of the 8th pair upon it, is regarded, by Professor Owen, as the true digestive stomach.

Dental formula: Incisors $\frac{4}{4}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{5\text{-}5}{5\text{-}5}$, = 32.

PRESBYTES CEPHALOPTERUS. *Zimm.*

The Nestor—Kalloo Wanderoo—*Sing.*

Syn : Cercopithecus latibarbatus—*Geoff.*
Cercopithecus leucoprymnus—*Otto.*
Simia dentata—*Shaw.*
S. porphyrops—*Link.*
S. fulvogriseus—*Desmoul.*
S. Nestor—*Bennet.*
S. Johnii ? *Fischer.*
Purple faced Monkey—*Pennant.*

General colour of fur cinereous black, croup and inside of thighs whitish. Head rufescent brown. Hairs on the crown short, semi-erect. Occipital hairs long, albescent. Whiskers white, thick and long; terminating at the chin in a short beard and laterally angularly pointed. Upper lip thinly fringed with white hairs. Superciliary hairs black;

long, stiff, and standing erect. Tail long, albescent and terminating in a broad tuft, which becomes worn out in a state of captivity. Face, palms, soles, fingers, toes and callosities black. *Irides* brown.

Length of head and body of a full grown male 20 inches; of tail, 24½ inches.

Geographical Distribution.—Southern India and Ceylon.

This species is the common black monkey or "*Wanderoo*" of the Southern and Western Provinces. It is replaced in the highlands by the next species, closely allied to it, but considered quite distinct from the long known *P. Cephalopterus*, for which no doubt it has often been taken by the cursory observer. We have not observed *P. Cephalopterus* in higher parts than 1300 feet.

PRESBYTES URSINUS. *Blyth.*

The bear-like monkey—Maha Wanderoo—*Sing.*

Syn. P. Cephalopterus? *var* monticolus. *nobis.*

Fur long, almost uniform greyish black. Whiskers full, white. Occiput and croup, in very old specimens only, are paler coloured but scarcely albescent. Hands and feet nearly black. Tail long, less albescent at the base than at the terminal half, which is in most specimens grey. The other characters as in *P. Cephalopterus*, from which it is distinguished by its larger size, stouter limbs, longer hairs and want of grey on the occiput, croup and sides of thighs. The young and middle aged have a decided rufous shade throughout, and concolorous with the rufous colour of the head.

A full grown specimen killed at Newera-Ellia measured as follow:

	ft.	*In.*
Length from apex of nose to root of tail...	1	9
Do. of head from vertex to chin	„	4½
Do. of tail	2	2
Do. from elbow to tip of longest finger...	„	9½
Do. of palm	„	2¼
Do. from knee to heel...............	„	7¼
Do. of foot (from heel to end of toes)...	„	6
Do. of sole........................	„	4

Geographical Distribution.—Mountains of Ceylon.

The first two specimens, from one of which Mr. Blyth described his *P. Ursinus*, were obtained from Newera-Ellia, where this is the only monkey seen and in great abundance. Since then, we have received specimens from various parts of the high Kandyan districts. It appears to represent in the highlands the "black Wanderoo" (*Presbytes Cephalopterus*) of the maritime provinces of the south and western portions of the Island. This highland monkey appears to attain a larger size in the more alpine parts. Very large sized individuals are seen about Rambodde pass. A young one, which we kept for several months in Kandy in good health, pined and died soon after its arrival at Trincomalie, where neither it nor the *P. Cephalopterus* are found, but are represented by the next species.

PRESBYTES PRIAMUS. *Elliot* and *Blyth.*

The crested Monkey—Koondé Wanderoo—*Sing.*

Greyish *Chocolat au lait* colour, with the *lait* predominating, and often with a fulvous tinge. Hands and feet generally of a lighter grey. Abdomen and inside of limbs, and sometimes the croup, of a dull white colour. Hair moderately long, nearly straight. A thick compressed high crest on the vertex of head, of a pale fulvous colour. Whiskers greyish or buff, short and terminating on the chin in a short projecting beard. Whiskers continuous with greyish hairs on the forehead radiating from a centre. Upper lip scantily covered with white hairs. Occiput albescent. Superciliary hairs long, black; projecting horizontally over the brow and forming a kind of toothed peak to the cap represented by the high vertical crest. Callosities white (in most specimens) near the tail. Tail longer than the body; nearly of the same colour as the darker parts of the back and terminating in a long albescent tuft. Limbs long and look attenuated; hairs straight and greyish near the hands and feet. Toes covered with long grey hairs, some of which project over the nails. Face, palms, and fingers; soles and toes black. A full grown male measured,

	ft.	*In.*
Head and body	1	9
Tail	2	4
Shoulder to the tips of fingers	1	3
Leg (to heel)	1	5
Palm including fingers	„	4
Sole including toes	„	6

Small intestines 15 feet and 2 inches. Large intestines 3 feet 8 inches. Cœcum 4½ inches. Stomach sacculated, and corresponded, except in size, with Professor Owen's description of the stomach of the allied species *Presbytes Entellus*, found in the peninsula of India. The liver two lobed; right lobe with a deep central cleft having a small lobule behind. Left lobe smaller with one long and another shorter posterior lobule. Gall bladder 1½ inch long. Spleen large, of an irregular quadrangular shape. This monkey is very common in the northern and north-eastern parts of the Island, and its range extends even to the rocks of Dambool and it is occasionally also seen about Matelle, Kaduganavà, Hewehette, and probably extends to Batticaloa and Hambantotte on the south-eastern side of the Island. We have recently seen a large monkey within seven miles of Trincomalie (near the hot wells of Kanniai), which from a distance we took for the next species, *P. Thersites*, as no crest was visible on any, and the animals were of of a much darker colour than the generality of *P. Priam*; but on obtaining a fine full grown individual, we discovered our mistake, as the animal has a very small tuft of hair on the crest, scarcely an inch high, the rest of the hairs of head shorter and the radiating centre of white hairs on the fore-head, placed almost on the brow and very indistinct. Colour of head fulvous dark grey or brown. Body very dark grey, without any shade of fulvous; some long grey hairs hang down the back from the shoulders; abdomen and limbs as in the darkest forms of *P. Priam*. This monkey we take for the present to be merely a variety of *P. Priam, verus*. The only specimen we examined measured as follows:

	ft.	*In.*
Head and body	1	10
Tail	2	8
Arm	1	4½
Leg	1	6
Palm	„	3
Sole	„	5

Small intestines 19 feet 8 inches; large 4 feet 8 inches; cœcum 5½ inches. Stomach sacculated, and other viscera as in the above description

Geographical Distribution.—Southern India and Ceylon.

P. *Priam* is easily distinguished from all other known species of monkeys in Ceylon, by its high compressed, vertical crest, its slender limbs, and fulvous grey colour of the head and parts of back and sides. Both sexes nearly alike, a few bright yellowish hairs on the posterior part of the abdomen of full grown females. In a very young live specimen (scarcely a few days old) the vertical crest was distinctly visible. The body, head and limbs were light grey and concolorous, without fulvous tinge in any part. This youthful "Priam" was actually sustained at a woman's breast, (who volunteered her services for several days), till it was taught to lap up milk from a saucer. We watched with considerable interest the infantile and youthful progress of this future Presbytes. It grew quite affectionate to its master and attendants. We had its miniature taken by the best artist at Colombo, and which we hope will grace the title page of this little work of our leisure hours. The climate of Colombo at last disagreed with its general health, and it died of a decline, which was indeed the fate of all our pets, brought into the low country from the highlands, though placed on our leaving Colombo in the care of several friends who were acquiring a taste for Natural History.

PRESBYTES THERSITES. *Blyth* and *Elliot.*

The grey Monkey—Ellee Wanderoo—*Sing.*

Uniform dusky grey colour (devoid of fulvous tinge) on the upper parts, darker on the crown and forelimbs, and passing into a dull slaty brown on the wrists and hands; the hairs upon the toes whitish or dull white; no crest upon the vertex (as in *P. Priamus*) nor does the hair there form a transverse ridge, as in the living *P. Entellus*, face surrounded with white; narrow over the brows; the whiskers and beard more developed than in other entelloid Indian species, and very conspicuously white, contrasting much with the crown and body, which are darker than in *P. Priamus.*

Geographical Distribution.—Ceylon.

The above description is Mr. Blyth's, of a monkey sent by Dr. Templeton to the Bengal Asiatic Society. We are all but sure of having seen this monkey (a tame one) in the neighbourhood of Badulla, in the Ouvah district. Mr. Edgar Layard informs us that Dr. Templeton obtained his specimen from Trincomalie, but where *we* have not found any other monkey than *P. Priam verus* and the variety above described, neither of which can we identify with *P. Thersites.* The only monkey which we have lately obtained and which may be identified with *P. Thersites*, is a young one from Doombera, but said to have been originally brought from Bintenne; it is still alive: it came into our possession at the same time as the young of *P. Priam* noticed above. Though a little older animal it had no appearance of a crest, the colour was even then darker, and the hair not so silky. We brought this monkey with us to Trincomalie, and while writing this account, we are enabled to compare it with a live specimen of a youthful *P. Priam* of about the same age, obtained from Nicholson's cove, near Fort Ostenburg; the latter is decidedly of a paler colour with a distinct fulvous tinge; whereas, in the former there is not the slightest trace of fulvous. The beard of *P. Priam* is of a dull white or buff colour, straight, coarse, and laterally thrown rather backwards; in our Doombera monkey, the whiskers are of a whiter colour, composed of a finer description of hair, much more abundant, but not terminating laterally as in *Presbytes Cephalopterus* and *P. Ursinus.* From both of these it is easily distinguished by its uniform dark grey, without any blackish shade; fore-arms and legs of a dull slaty colour. Face ears, soles and palms black. Tail albescent. It is a more lively animal than *P. Priam*. Its limbs are not so slender. Its Physiognomy is not so melancholic, nor does it sit often in languid positions. Both eat the same kinds of food; fruits, pods, young leaves and shoots; they perform scarcely any mastication.

To that distinguished comparative anatomist, Professor Owen, are we indebted, for a faithful description of the stomach of the entelloid group of monkeys, which all the species we have examined possessed in common. In the arrangement too, of the other abdominal viscera of *P. Priam*, it corresponds with that observed by Professor Owen in *P. Entellus*, viz: the liver instead of crossing the epigastre, occupies the whole of the right hypochondrium, and extends downwards to the lumbar region, and the spleen is attached to the omentum continued from the left side of the stomach.

As in *P. Entellus*, the Ceylon species of *Presbytes* have also long intestines, in nearly the same proportion, viz. 8 of intestines to one of body. The contents of the stomach and intestines of all the individuals, brought dead from the jungle, were of the same vegetable matter: the second portion of the stomach contained only half digested leaves and fruits, the upper portion contained bits of leaves or pieces of fruit scarcely masticated, the lower portion contained a thin greenish matter semifluid in some instances. We have watched frequently the habits of these animals in the jungles: they are generally seen in groups of three or four, hopping from branch to branch of large trees, and when they sit, they are seen to lop off with their hands tender branches, which they nearly deprive of leaves, by biting them off rapidly. They will sometimes use their hands to remove the tender leaves and shoots and introduce them into the mouth. When tamed, they will eat almost any kind of vegetable food; boiled rice, bread and plantains are their chief food in confinement. They are also fond of peas and beans. We have never observed them eat animal food in any shape; nor are they fond of sweets. It is curious to observe how well they select the most juicy or wholesome leaves from a mass of all kinds thown to them. Leaves and fruits of a balsamic odour are disliked; they invariably smell the leaves before even breaking them off the young branches. We have not observed them to ruminate. They sleep sitting on the callosities, knees bent, and head bowed down between the arms, which are folded on the knees. In a captive state they are subject to diarrhœa, and apparently to tubercular disease of the lungs and mesentery. Tubercular deposits were found in several which died in captivity.

PRESBYTES ALBINUS. *Nobis.*

Fur dense, sinuous, nearly of a uniform white colour, with only a slight dash of grey on the head. Face and ears black. Palms and soles, fingers and toes flesh coloured. Limbs and body, the shape of *P. Ursinus.* Long white hairs prolonged over the toes and claws, giving the appearance of a white spaniel dog to this monkey. *Irides* brown Whiskers white, full and pointed laterally.

The above description is taken from a live young individual, sent to us by Mr. Jansen from Matelle, which has since died; and the stuffed specimen is now *en route* to Mr. Blyth. At first, we considered the white monkeys, (the existence of which in the Island we have often heard asserted), were merely albinos of *P. Cephalopterus* or *P. Ursinus.* But the black colour of the naked parts of the face and ears, and the dark brown of the eyes, incline us to believe that they are of a distinct species. The Kandyans assured us they are seen (rarely however) in small parties of three and four, over the hills beyond Matelle, and never in company with a dark kind.

Although we have now described five distinct species of *Presbytes,* we do not despair of still finding others, in parts of the Island that have not yet been explored. Our attention has often been directed to a species of monkey in the Elephant park in Bintenne, which sportsmen, frequenting the park call, the "spectacle monkey"; we have not visited that part of the Island, and hitherto we have not succeeded in getting any specimens from that interesting locality. We are not acquainted with the monkeys between this and Hambantotte, nor are we certain what species are found in Adam's Peak and the Saffragam district. But from all accounts the *P. Ursinus* is also there with the common *Macacus Sinicus.* However, it is well worth enquiring into, by any one who may have an opportunity of doing so.

GENUS. MACACUS. *Lacep.*

Pithecus. *Geoff: Cuv.*

Canine teeth very strong, particularly in the males; the first and second molars have two tubercles on their crown, the three others have four; with the exception of the last of the lower jaw, which has five and which is terminated by a heel; facial angle 40° to 45°; superciliary ridges much developed; muzzle broad and projecting; eyes approaching; nostrils oblique; ears naked, close to the head, angular. Cheek pouches. Lips thin and extensible. Callosities.

Dental formula: Incisors $\frac{4}{4}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{5\text{-}5}{5\text{-}5}$, $=32$.

MACACUS SINICUS. *Linn.*

The bonneted Macaque—Rilawa.—*Sing.*

Syn: Simia Sinica.—*Linn.*
Cyanoceph: Sinensis.—*Latr. Buffon.*

Fur yellowish brown, with a slight shade of green in old specimens. In some the back is of a light chesnut brown colour. Abdomen and inner parts of thighs of a dull white. Yellowish brown hairs on the crown of the head, radiating from the centre to the circumference. Face flesh-coloured, beardless. A few straggling black hairs on the cheeks and lips. *Irides* reddish brown. Ears, palms, soles, fingers and toes of a blackish colour. Callosities flesh coloured. Tail rather long, terminating in a short tuft.

A full sized specimen measured head and body 21 inches. Tail 18 inches. Larger ones are seldom seen.

Geographical Distribution.—Southern India, China, Ceylon.

This Monkey, the "Rilawa" of the Singhalese, is a lively spirited animal, but easily tamed; particularly fond of making grimaces, with which it invariably welcomes its master and friends. It is truly astonishing to see, the large quantity of food it will cram down the cheek pouches for future mastication. The *Rilawa* is very abundant in all parts of the Island, particularly common about Chilaw and Putlam, where there is also a small variety of a paler colour, but which requires further examination. They are longer lived when tamed than the Wanderoos (*Presbytes*) of Ceylon. They will sometimes eat boiled meats, and they are very dexterous in catching flies and smaller insects, which they are sometimes seen to eat. Domestication seems to make them pure vegetarians. In a wild state, we doubt not, they are partially carnivorous or at least slightly insectivorous.

We have seen several specimens of *Macacus Silenus, L.* the black monkey (the wanderoo of authors), brought from the Malabar Coast, and one is now alive in our little menagerie.

Dr. Templeton, we believe, was the first naturalist who pointed out the error found in all books, that this species (*Mac. Silenus*) is also a native of Ceylon. None have hitherto been seen, in the wild state, in any part of the Island explored by a naturalist; and probably, Dr. Templeton is correct in saying, that it is not found in the Island. How the native term "*Ooanderoo*" or "*Wanderoo*", (which they invariably give only to species of the genus *Presbytes*), has been applied by authors to the black *Macacus*, is easily explained—The Portuguese population apply the term *Oanderoo* to it, and no doubt the Dutch borrowed it from them, and probably fixed this appellation to labels on specimens (they sent to Buffon and others) which originally came from the Malabar Coast.

Macacus Silenus L. is of a black colour; has a short tail and an ash coloured ruff round the face and head. The Ceylon "*Rilawa*" resembles much the allied species found in Southern India *Macacus radiatus* (Desm) but is easily distinguished from it, by its less robust make and smaller size. The latter is also of a deeper greenish shade and has flesh coloured ears, palms and soles. Native Jugglers from the coast exhibit both these monkeys at fares and shows. Our Ceylon Rilawa appears on these occasions to less advantage, at gymnastics, than its neighbour; the latter is also somewhat more intelligent and less mischievous. But both are capable of great improvement in social manners; they afford much amusement to children, (to whom however they are not very partial), and even adults of "*the sole genus and sole species*" cannot but wonder how intelligent a monkey may become by tuition. *

FAM: LEMURIDÆ.

GENUS. STENOPS. *Illig.*

Loris. *Geoff.* *Lacep.* Lemur. *Gmel.*

A genus allied to the true Sloth or Lemur. Upper incisors very small, separated in the middle, inferior inclined, contiguous, and very small, molars with sharp pointed crowns; head round; muzzle turned up; nose prolonged; eyes very large, separated by a very thin bony partition; ears short and hairy; four pectoral mammæ; no tail; bones of the arm and leg distinct, tibia larger than the femur; tarsus and metatarsus of equal length.

Dental formula: Incisors $\frac{4}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{6\text{-}6}{5\text{-}5}$, $=36$.

STENOPS GRACILIS. *Geoff.*

The Indian Sloth—Oona happolava.—*Sing.*

Syn: Loris gracilis.—*Geoff.*
Lemur tardigradus.—*Schreb.*
Lemur loris.—*Zimm.*
Lemur Ceylonicus.—*Fischer.*

Fur short, dense, soft, of a velvetty feel; above, of a tawny snuff brown colour, with an indistinct darker line on the dorsal region. Beneath and inner sides of limbs of a pale fulvous brown colour. A triangular white spot on the fore-head carried down on the nose. Ears small oval; Limbs long and slender; a hooked claw on the inner toes, nails of the other toes flat; posterior third of soles and palms hairy.

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* Since writing the above remarks, we have purchased a live young *M. radiatus*, said to have been brought from the jungle, between Trincomalie and Anarajapoora.

An adult male measured,

From snout to vent	8	inches
Length of arm	5	„
Do. of leg	5⅝	„
Palm	⅝	„
Sole	1¼	„

Small intestines 1 ft. 10 in.; large intestines 1 ft. 1 in.; cœcum 2 in.; stomach 1¾ in.

Geographical Distribution.—India, Ceylon.

The Loris or Sloth of Ceylon is seen only in the lowlands. It is quite a nocturnal and arboreal animal, of very slow movements. It sleeps during the day and is active at night. Its hold or grasp is very tenacious. It is said to prey upon insects, lizards and eggs of birds; and also to feed on small birds. In confinement it partakes freely of sweet vegetable food, but rarely animal food. It is particularly fond of honey and syrup.

Mr. Simon Casie Chitty informs us, of his having seen a blackish Loris, distinct from the one we have just described; which is also found in the Chilaw district; this may possibly be the *Nyctioebus tardigradus*; but its existence requires confirmation: both are found in India.

Nycticebus Ceylonicus, Desm, Geoff. is described in Stark's Elements of Natural history, to have blackish brown fur, "entirely black upon the back." We have not seen a Loris corresponding to these characters.

ORDER. CARNARIA.

FAM: CHEIROPTERA.

a. Insectivora.

GENUS. MEGADERMA. *Geoff.*

The conch of the ears very large, and brought together on the top of the head. The tragus large and most commonly bifurcated. Nasal membranes complicated; composed of three distinct leaflets or crests, one vertical, one horizontal, and one inferior of a horse shoe shape. Interfemoral membrane entire; no tail.

Dental formula: Incisors $\frac{0}{4}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{4\text{-}4}{5\text{-}5}$, $=26$.

MEGADERMA LYRA. *Geoff.*

Syn. Meg. Schistacea. *Hodgson.*

Above, ashy blue; hairs long and silky. Beneath paler; shorter hairs. Ears, large naked, except on its upper edge, which is hairy; joined together by its base above the forehead. Oreillon long, cordate anterior lobe narrow, long, and pointed; posterior lobe small, rounded. Alar and interfemoral membranes dark brown; the latter supported by long tibial spurs. Two pairs of mammæ. An ordinary sized one measured,

Head and body............	3	inches
Interfemoral membrane......	1¼	„
Alar expanse	14½	„
Radius	2. 2-10	„
Tibia......................	1. 1-10	„

Geographical Distribution.—India, Ceylon.

None of the specimens examined by us, were of the dimensions given by Mr. Hodgson. The Megaderme is found only in some parts of the Island. We have received specimens from Kadugannava, Point Pedro, and from the neighbourhood of Anarajapoora. For a minute description of the characters and habits of this bat, see Mr. Hodgson's excellent Monograph, in J. As. S. B. vol. for 1847.

GENUS. TAPHOZOUS, *Geoff.*

Chaffron with a sillon or rounded indenture on the forehead; upper lip thick; ears moderate and wide apart. Tail fine towards its point, which is free above the prolonged and angular interfemoral membrane. The males have a transverse cavity under the throat, which appears in some species to be developed only at some seasons of the year. (see appendix)

Dental formula: Incisors $\frac{0}{4}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{5\text{-}5}{5\text{-}5}$, $=26$.

TAPHOZOUS LONGIMANUS. *Hardw.*

Above, dusky or rufescent brown; tips of hair, darker. Beneath paler; darker on the neck and throat. About half-way down the interfemoral membrane the tail is free. Membranes dusky.

Total length about 4¼ inches, of which the tail measured one inch; alar expanse 14 inches; radius 2½ inches; tibia 10-12 inches.

Geographical Distribution.—India, Ceylon, Java.

This bat is rare in the Island; the only specimen examined was from Colombo, which Mr. Blyth has been so good as to identify for us. We have obtained another *Taphozous* at Trincomalie, which we are inclined to believe is the *Taphozous brevicaudus* of Blyth; but the tail and interfemoral membrane were so mutilated that only an imperfect description of it can now be given; but this no doubt, with the imperfect specimen sent to Mr Blyth, will enable that eminent naturalist to inform us what species it is.

TAPHOZOUS BREVICAUDUS. *Blyth,*

Face and ears as in former species; only of smaller dimensions. Upper parts of a dark ashy brown, nearly black; base of hairs greyish. Beneath paler. Membranes dusky. It measured as follows;

Supposed total length about 3¼ in., of which the head and body measured 2¾ in.; radius 2. 3-10 in.; tibia 8-10 in.; longest digit 3 4-10 in; alar expanse 12½ in.

Geographical Distribution.—India, Ceylon.

GENUS. RHINOLOPHUS. *Geoff. Cuv.*

a. Rhinolophus. *Gray.*

Nose at the bottom of a cavity, bordered by a wide crest of a horse shoe shape, and surmounted by a leaf or crest of a pointed or triangular shape. Anti-helix distinct and sometimes considerably developed. Females have frequently pubic warts simulating mamillæ, to which the young ones are supposed to cling. Tail long, entirely enveloped by the interfemoral membrane, which is very much developed.

Dental formula: Incisors $\frac{2}{4}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{5\text{-}5}{6\text{-}6}$, $=32$.

RHINOLOPHUS RUBIDUS. *nobis.*

Above, of a bright red-ferruginous brown; tips of hairs darker. **Beneath** paler. Ears pointed and external edge deeply emarginated; internal edge and basal third of external surface hairy; anti-helix well developed. Pubis hairy; inguinal warts in some. Females of a browner red colour, and rather smaller. Nasal process apparently very similar to that of *R. mitratus.* Blyth. The mesial or central cup above the nostrils, appears to be a continuation of a depression or furrow in the anterior part of the vertical leaf. Below the triangular peak is a transverse leaf, connected to the lower surface of the peak by a septum, which divides both, into two cup like depressions. The tip of the peak emarginated and reaching above the base of ears.

Head and body	2. 3-10	inch.
Tail	9-10	„
Fore-arm	1. 9-10	„
Tibia	9-10	„
Longest digit	2. 8-10	„
Ears, anteally (long)	7-10	„
Tragus (broad)	3-10	„
Alar expanse	12	„
Weight, of a large one	4 dr. 20	grains.

Geographical Distribution.—Ceylon.

The first specimen, of this beautiful Rhinolophus, was obtained from the Central Provinces, and since that, we have seen several from Trincomalie, and its neighbourhood. In colour it resembles more the *Hipposideros fulgens*, Elliot, than *Hip. aureus*, nobis. Some specimens were of a brighter red than others, and a few had a yellower tinge. Besides these varieties, another marked variety, in great numbers, of almost a uniform pale yellow brown colour, was obtained from the same localities, which may either be only a variety or a distinct species;—probably, *R. mitratus* of Blyth. Size equal to that of the last species.

RHINOLOPHUS CINERASCENS. *nobis.*

Syn. Rhinolophus tragatus? *Hodgson.*

Above, dusky or ashy brown, base of hairs paler than at the surface. Below paler. Nasal process and antihelix as in the last species.

Total length 3 in., of which the tail 8-10 in.; fore-arm 1. 8-10 in.; tibia 7-10 in.; alar expanse 10½ inches.

Geographical Distribution.—Ceylon.

We are indebted for specimens of this species to Mr. Pett, of the Ordnance Department, who caught them in under ground passages in Fort Fredrick, where bats of many kinds are frequently found.

RHINOLOPHUS RAMMANIKA. *nobis.*

Above rufescent brown. Beneath ashy brown. Face slightly fulvous Round the base of the ears and on the sides of the posterior half of the body, bright fulvous. Tail enclosed in the interfemoral membrane.

Head and body	2½	inches.
Tail.............................	1	„
Alar expanse	10	„

Only one specimen was procured from Amanapoora hill at Kaduganava, and this we have forwarded with other specimens to the Zoological Society of London. As the specimen reached us in a dried condition, we are unable to say any thing more about its nasal processes, than that in place of a transverse process, above the nostrils, it had a small triangular peak over the usual horse shoe shaped iprocess, surrounding the nasal opening. This triangular crest was hairy superiorly; there was no appearance of a sac above it, to the best of our recollection. Doubtful as we were of its true characters, we hesitated to give it any specific name, but now we have added one, which will facilitate future reference to this bat, should our successors, in the field we are about to quit, meet with specimens of the genus *Rhinolophus* of Gray, answering to the above characters.

If all the Rhinolophine bats we have here described, are of distinct species, the Fauna of Ceylon, will have four species of the restricted genus Rhinolophus.

b. HIPPOSIDEROS. *Gray.*

Differing from *Rhinolophus* in having no distinct antihelix, with the surmounting nasal leaf transverse and recurved. Tail generally excerted at the tip, from the interfemoral membrane; but can be drawn within the sheath by manual force; whether this can be done voluntarily by the animal, remains to be ascertained. In most species there is a circular cavity or sac, behind the crest; which the animal can turn out at pleasure, like the finger of a glove; it is lined with a pencil of stiff hairs. When alarmed, the animal opens this cavity and blows it out, during which it is protruded and withdrawn at each breathing.

This cup or purse contains a waxy matter, of a green or yellow colour; apparently secreted by a follicular gland. Ears distinct and very mobile or tremulous; striated transversely.

Dental formula: Incisors $\frac{2}{4}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{4 \text{ or } 5}{5}$, $\frac{4 \text{ or } 5}{6} = 28 \text{ or } 30$.

Mr. Walter Elliot (from whose description of this genus we have quoted) observes with regard to its dentition, that "the upper incisors are distant, placed near the canines and triangular, broad at the edge, and sloping back to the root, the lower ones are close together crenulate at the edge, each having three points." In all other respects the characters are the same as in Rhinolophus.

HIPPOSIDEROS FULVUS. *Gray.*

Syn. Rhinolophus fulgens. *Elliot.*

Head and body of a light orange brown colour. Membranes blackish. Interfemoral membrane narrow. Tail excerted at the tip.

Length of head and body……1½ inch
Do. of tail………………… ¾ „
Alar expanse ………………8 „

Nasal processes (as Mr Elliot also observes) are more developed in this species than in *H. murinus*; and like it, this bat has not the three dermal folds found in *H. speoris*, &c.

Geographical Distribution.—Southern India, Ceylon.

We have received specimens of this beautiful bat from only one locality,—Kaduganawa, a mountainous part of the Island, about 12 miles from Kandy, and about 1200 feet high. It is not even there common: a more recent specimen received from thence, and which we forwarded to Mr. Blyth, has enabled us to correct our mistake in confounding this bat, with an undescribed species of *Rhinolophus* of nearly the same colour—*H. rubidus*, nobis,

In the hurry of packing up specimens for the Zoological Society, on the eve of our departure from Kandy, we have, if not much mistaken, sent also a bat, precisely of the same size and colouring as *H. fulvus*, but without any nasal appendages, the face being hairy to the muzzle. This bat, which was received with the other red bats from Kaduganava, was thereby completely lost sight of, and therefore, should this notice meet the eye of the Secretary of the Zoological Society, we hope he will find out, whether it is a distinct species of bat or abnormal form of *Hipposideros fulvus.* Elliot.

HIPPOSIDEROS MURINUS. *Gray.*

Syn. Rhinolophus Murinus. *Elliot.*

Muzzle short. Body short and thick. Above dusky brown; this colour is only confined to the extreme tips of the hairs, the rest being silvery grey. Beneath uniform dusky grey. Nasal process simple; no dermal folds on the sides of the horse shoe leaf. Sac behind the transverse crest. Ears large, naked. Membranes blackish. Interfemoral membrane investing the tail, with the exception of its extreme tip. Two pectoral mammæ and two inguinal warts.

Head and body............	1.8-10	inch.
Tail	1.2-10	„
Radius	1.5-10	„
Tibia....................	7-10	„
Alar expanse,..............10		„

Geographical Distribution.—India, Java, Ceylon.

This bat ,which we take to be the true *H. murinus* of Elliot and Gray, we found at Colombo, Caltura, Negombo and Kandy; but never together with the following species, which we regard as distinct, if colour is a good specific guide, as it seems to be, with respect to many other of the Rhinolophine bats.

HIPPOSIDEROS ATRATUS. *nobis.*

Syn. Rhinolophus Ater. *Templeton.*

Hip. murinus. *var,* apud *Blyth.*

Rather smaller than the last. The surface colour of the back darker nearly black. Ears large, cordate; 7-10 in. long, anteriorly; inner edge hairy internally; external edge slightly waved; this character is very conspicuous in some specimens. The difference in size, from *H. murinus,* is in linear dimensions. In other respects alike.

Head and body 1.6-10		inch.
Tail...............................1.1-10		„
Radius.............................1.3-10		„
Tibia	5-10	„
Alar expanse ....9 ½		„

Geographical Distribution.—Ceylon.

Found at Colombo, but it is not so numerous as *H. murinus.* We also procured a few at Kandy and Trincomalie. From the latter locality we have not obtained a single specimen of *H. murinus.*

HIPPOSIDEROS SPEORIS. *Gray. Geoff.*

Syn. Rhinolophus speoris.—*Elliot.*
Hipposideros apiculatus—*male.* } *Gray,* apud *Blyth.*
Hip. penicillatus—*female.*

Above dusky black, or mouse brown; base of hair paler. Beneath uniform ashy brown. Membranes dusky brown. Interfemoral membrane narrow; enclosing the tail, except about 2-10 in. of its extreme point. Tail composed of 4 or 6 joints. Pubis naked, with two inguinal warts in most specimens. Males have a frontal sac. Females none. Nasal process more complicated and more developed than in *H. murinus*; there are three additional folds of skin on each side of the horse shoe; the outer-most of these shorter and otherwise less distinct. The following dimensions are about the average of a dozen specimens.

Head and body	2	inch
Tail	1. 2-10	„
Radius	1. 8-10	„
Tibia	8-10	„
Alar expanse	11½	„
Weight	3 dr. 20 grains.	

Females are of a lighter colour; nearly of the same dimensions.

Geographical Distribution.—India, Ceylon.

We have some doubts of the identity of this species with *R. speoris* of Elliot's catalogue, which appears to be a larger bat, weighing more than 6 drachms. In proportion, the bat we have identified with *H. speoris*, is nearly equal to Syke's *R. dukennensis*, which Mr. Blyth identified, if we are not mistaken, with *Vesp. speoris*, Desmarest. Between this bat and the next species, there are others, which vary so little in colour one from the other, that it is difficult to say to which they belong; for the present we shall consider them intermediate varieties. *Hip. speoris* is very common at Trincomalie, but appears later in the year than the following, which is equally common there.

HIPPOSIDEROS TEMPLETONII. *nobis.*

Syn: Rhinolophus Voulha.—*Templeton.*
Hipposideros vulgaris. *Horsf.* var. apud *Blyth.*

Above dusky or rufescent brown, bases and extreme tips of hairs greyish. Beneath uniform light brown. In dried specimens hoary tips are here also observable. Membranes dusky, lighter colour than in the last species. Tibial spurs longer than in *H. speoris*; and ears broader, but of the same pyriform shape, and acutely pointed, (inner edge slightly hairy in both.) Nasal process rather more developed. Pubis naked. Pectoral mammæ two; and two inguinal warts. Frontal sac as in the last, well developed and secreting a greenish matter. Females have no frontal sac, or have one only imperfectly developed.

Head and body	2. 1-10 inch.
Tail	9-10 „
Radius	2 „
Tibia	9-10 „
Alar expanse	11 „
Weight	3 dr. to 3 dr. 20 grains.

Geographical Distribution.—Southern India, Ceylon.

This bat is the one we formerly described, in the Journal of the Asiatic Society of Ceylon, as Dr. Templeton's *Rhinolophus Voulha.* Our description of *H. Templetonii*, was not from a specimen of the bat which is identified by Mr. Blyth with *Hip. speoris.* The grey of the extreme tips would have been noticed in our former description had it been more conspicuous; and now we only do so, as our attention has been attracted to it by Mr. Blyth's account of this bat; which he thinks is only a variety of *H. vulgaris* of Gray; but, as Dr. Templeton's description was published in Ceylon, we believe anteriorly to Mr. Gray's, we have ventured to call it after a naturalist who has not laboured unsuccessfully in Ceylon. *Voulha*, the specific term applied by Dr. Templeton to this bat, is objectionable, as the Singhalese term "*Voulha*" is a generic one, applied to all bats indiscriminately.

This bat is common at Kandy, in churches and godowns; and is also found in the same situations at Colombo and Trincomalie, where it is more abundant than any other species. We have seen males without any frontal sac; and we are inclined to believe that the sac is only developed at certain seasons, which is a peculiarity observed also by Mr. Blyth in other species of bats. In many specimens we have examined there was a glandular body behind the well developed sac, which, we should say, secreted the waxy matter: this gland was not visible when the sac was obsolete or undeveloped.

HIPPOSIDEROS AUREUS. *nobis.*

Syn: Hipposideros larvatus. var?—*Horsf.*

Face and chin brown, nearly naked; ears small, erect, apiculated;

naked, with the exception of the inner edge and base of the external surface. Head, neck and body of a bright golden yellow, with a slight maronne shade on the tips of the hairs on the back. Fur dense, soft and rather long. Membranes dusky brown. Tail short and excerted for about 2-10 inch of its extreme point. Interfemoral membrane narrow and squarish, supported by moderately sized tibial spurs. Nails yellowish. Pubis naked. Females paler coloured, with less of yellowish and more of a browner tinge; and may be mistaken for the female of another species, but that they are sometimes found together under the same roof of old temples.

Total length 3½ inch, of which the tail 1. 2-10 inch. Radius 1. 8-10. Tibia 8-10 inch. Ears 6-10 inch long anteally, and 5-10 inch broad, at lower third. Head 8-10 inch long. Alar expanse 11½ inches to 12½ inches.

Geographical Distribution.—Ceylon.

This bat is found in some abundance at Trincomalie, in the months of June, July and August. Fine specimens of it were received from Sober Island in the harbour of Trincomalie.

Mr. Blyth has not yet seen this bat; on comparing it with his description of *H. larvatus* Horsf. we cannot consider both as of the same species. The bright golden colour in many specimens strongly contrasts with the browner face; and the membranes are not at all tinged with the hue of the body. Frontal sac only in males. The waxy matter in this species is of a yellow colour and quite transparent. Mammæ and inguinal warts as in last species. This bat is easily distinguishable from *H. fulvus* by its larger size, and more complicated nasal processes, which resemble those of *H. speoris* and *H. Templetonii*, and are perhaps more developed than even in the latter. *H. rubidus* is a reddish bat, but there is no red in *H. aureus* nobis, except in the slight maronne shade on the tips of the hairs on the back.

HIPPOSIDEROS LANKADIVA. *nobis.*

Syn. Rhinolophus insignis.—*Waterhouse*?

Head long, muzzle short, but face prolongated. Nasal processes as in *H. speoris* and proportionately more developed. No frontal sac, but two separate tubercular points, (with a broad intervening space between,) above the transverse nasal crest. On these tubercles a few short stiffish hairs are seen in most specimens. Ears large, acuminated; naked, with the exception of the inner edge; emarginated externally, near the apex. Body long; upper parts covered with rather long, soft, dusky brown tipped greyish fur; extreme points again shaded off with grey as in *H. Templetonii.* The brown terminations being shorter, and of a lighter shade on the hairs of the neck and part of the shoulders, show off the long greyish bases more conspicuously on these parts; and thus, too, forming a line of demarcation on the shoulders, at the juncture of these two shades of surface colour. Beneath of a uniformly light dusky colour. Membranes dark brown. Interfemoral membrane acuminated, and investing the whole tail; which is not at all excerted. Pubis hairy. Both sexes nearly alike. Females a little paler on the back.. This is the largest of the Rhinolphinæ hitherto seen in Ceylon; a large male measured,

Head and body	4¼	inch.
Tail	2	„
Radius	3	„
Tibia	1½	„
Longest digit	4¼	„
Alar expanse	21	„

Ears anteally, 10-12 inch long, and nearly as much broad at the middle; between the ears ¾ inch. Foot with claws, 8-10 inch. Weight 2 oz. and 3½ drams.

Geographical Distribution.—Ceylon.

This large horse-shoe bat, is found in great abundance at Kandy and its neighbourhood: Kurnegalle Tunnel (cut through a rocky hill) swarms with them. They are also seen at Kaduganawa. Mr. Blyth has not seen this bat; but from our description of it he thinks it identical with *R. insignis* of Waterhouse's Catalogue.

HIPPOSIDEROS BLYTHII, *nobis*

Above, surface colour a rich dark tawny brown; base of hairs much lighter coloured, of a brighter yellow tinge. Beneath paler. Face partially blackish. Ears black. Tip of tail excerted. No frontal sac. Membranes blackish. Nasal processes as in *Hip*: *speoris.*

The only two specimens examined were females; the largest measured,

Head and body	2. 2-10	inch
Tail	1.	„
Fore arm	2.	„
Tibia	9-10	„
Alar expanse	12¼	„
Weight	3 dr. 10 grains.	

Geographical Distribution.—Ceylon.

This bat was also found in Fort Frederic, and is apparently new or undescribed; certainly quite distinct from every other species of *Hipposideròs* seen in the Island. The rich tawny brown (when the specimen was fresh) resembled that of *Nycticejus Heathii;* but it has since faded in drying. The greater length of the fore-arm, would also distinguish this species from *H. speoris* and *H. Templetonii.*

GENUS. SCOTOPHILUS. *Leach.*

Four upper incisors, unequal, pointed; the intermediate ones being largest and simple; and the lateral ones bifid, with equal lobes. Six lower incisors, indistinctly trifid. Two canines above and below. The upper ones with a small point behind the base; and the lower ones with a similar one in front. Four molars, crown armed with points.

Mr. J. E. Gray confines this genus to the species which have the wings attached to the ankle, as far as the base of the toes.

Dental formula: Incisors $\frac{4}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{4\text{-}4}{4\text{-}4}=30$.

SCOTOPHILUS CORAMANDELICUS. *Blyth.*

The pigmy bat—Cossetta Voulha—*Sing.*

Syn: Vespertilio Coromandelicus—*F. Cuv.*
Vesp: irretitus.—*Cantor,* apud *Blyth.*
Vesp: pigmæus?—*Leach,* apud *Templeton.*

Fur short; above dingy fulvous brown at the surface; below paler and greyish fulvous. Membranes dusky brown.

Not having a specimen of our own to describe from, we must quote further from Mr. Blyth's description of it. J. A. S. Bengal No. 2. 1851.

Expanse 7½ in:. Longest digit 2 to 2⅛ in:. Total length 2⅝ in:, of which the tail measures 1⅛ in:. Ears broad, exceeding ¼ inch in length. Tragus ⅛ in:, appearing lanceolate in the dry specimens, but in the fresh animal somewhat lunate, or a little curved forward and obtuse at the tip.

Geographical Distribution.—India, Ceylon, (Mr. Blyth.)

We have not seen in Ceylon a Scotophilus which quite answers to to the above description; but the very common *Scotophilus* we have collected and seen in various parts of the Island, even at Newera-Ellie, may be described thus.

Above sooty black, the extreme tips of hairs on the back and shoulders of a dingy fulvous grey, sometimes hoary. Beneath paler, with lighter grey or hoary tips. Membranes intensely black. Total length 2½ in:, of which the tail measures 1. 1-10 in:. Radius 1. 1-10 in:. Tibia 4-10 in:. Longest digit 1. 6-10 in:. Ears 3-10 in: long. Tragus 3-12 in:, lunate, blunt. Head scarcely ½ in: long. Expanse 7½ inches.

Dr. Templeton mentions two varieties of *Scotophilus*, (Vesp: pigmæus, apud Templeton.) We think they correspond with the above description of Mr. Blyth, and ours. Whether they are identical, remains to be ascertained. Specimens of the last have been lately forwarded to Mr. Blyth. We have since seen a much larger *Scotophilus*, which we shall provisionally name,—

SCOTOPHILUS CEYLONICUS. *nobis.*

Above sooty black with a slight rufous shade; extreme tips of some of the hairs on the back hoary. Beneath white or hoary, confined to the terminal half of hair, basal half dusky brown. The upper surface of the basal third of the interfemoral membrane covered with similar hairs as the back. Ears nearly as long as the head, narrow and obtusely pointed. Tragus short, narrow; nearly straight, blunt. The only two specimens we have examined were males, and both were nearly of the same dimensions.

Total length 3. 8-10 in:, of which the tail measured 1. 7-10 in:. Alar expanse 11 inches. Head 7-10 in: long. Ears 6-10 in: long anteally. Tragus 2-10 in:. Radius 1. 6-10 in:. Tibia 7-10 in:. Longest digit 2. 7-10 in:. Upper incisors 2 pairs, both indistinctly bilobed? or certainly the lateral ones are trifid. Weight 3 dr: 10 grains.

Both the specimens were procured by Mr. George Pett of the Ordnance Department, Trincomalie; who caught them one night (in his bed room) in the month of October. Probably this bat may be No. 11 of Mr. Walter Elliot's list of Bats.

GENUS. NYCTICEJUS. *Rafin.*

Like *Scotophilus*, except in having only two incisors to the upper jaw; which are widely separated and close to the canines.

Dental formula: Incisors $\frac{2}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{4\text{-}4}{4\text{-}4}$, = 28.

NYCTICEJUS HEATHII. *Horsf.*

Muzzle and ears blackish. Upper parts of a rich dark tawny brown with a greenish shade. Beneath golden brown; yellowish hairs on the under surface of alar membrane next the body and humerus.

A specimen from Negombo measured,

Head and body	3¾	inch.
Tail	2½	„
Alar expanse	16	„
Radius	2. 5-10	„
Tibia	1. 1-10	„
Head	1. 1-10	„

Geographical Distribution.—India, Java, Ceylon.

Mr. Edgar Layard forwarded us a specimen from Point Pedro, where it is common. Negombo, Colombo and Kurnegalle are the other localities from whence we obtained specimens.

NYCTICEJUS BELANEGRI. *Zimm.*

Syn: Scotophilus castanea,—*Gray*, apud *Cantor.*

Vesp. Belangeri—*Geoff.*
Vesp. Temminckii—*Horsf.*

Upper parts of a pale yellowish brown colour, with more or less of a greenish shade in the majority of specimens. Beneath silvery grey with a fulvous tinge; darker on the sides; grey hairs spreading on the under surface of alar membrane next the body and humerus.

Total length 4. 8-10 in: of which the tail measures 2. 3-10 in:. Expanse 13 in:. Radius 2. 1-10 in:. Tibia 8-10 in:. Head 8-10 in: long.

Females are of a paler colour; and one male specimen also found at Trincomalie, where this species is very common, had not the slightest tinge of brown on its back,—all pale yellow above; and fulvous white beneath. These bats sometimes skim along a little above the ground, and frequently alight and rise with great facility on being surprised. They seldom enter houses, but generally lodge on trees and bushes.

Geographical Distribution. India, Ceylon, Borneo, Java, Timor, &c.

There is one circumstance worth mentioning regarding bats in general, which has also not escaped the observation of Mr. Walter Elliot and others, viz: that males and females are seldom found in the same localities, at the same period of the year. For several weeks running, every one of the Nycticeji we caught was a male; and in the same localities a few weeks afterwards, there were only females to be found. The same may be said of other bats of the insectivorous tribe, and probably the frugivorous bats too, are not exempted from this peculiarity or mode of living. It would be interesting to ascertain when, and how often the sexes come together. Upon this point our observations are very limited.

NYCTICEJUS TICKELLI. *Blyth.*

Syn: Nycticejus Isabellinus.—*Blyth,* M.S. (*in Epistola.*)

Fur moderately long, soft, and straight or a little wavy; of a pale fulvescent or whitish fulvous colour, more or less tinged with maronne or vinous on the back. The membranes dusky, marked along the digits as in *Keri-voulha picta*; but the brighter colour spreading less upon the membrane, though the interfemoral is wholly or chiefly of this hue. There is a considerable growth of hair on the basal half of the interfemoral membrane above; also along the tibia, and especially upon the toes. The face likewise is hairy around the eyes, and on the muzzle. Ears triangular and obtusely pointed; the tragus broad and semicircular, and suddenly narrowing at tip; externally hairy for the basal half (J. A.S. B. No. 2. 1851.)

As the only two specimens we have seen, happen to be young ones obtained near Kandy and Trincomalie, we have transcribed the above characters from Mr. Blyth's description of this new species, which Captain Tickel sent him from Central India, before our specimen reached Calcutta. The following are the dimensions given by Mr. Blyth of an adult.

Length 4¾ in:, of which the tail measures 2⅛ in:. Expanse 16 in:. Length of forearm 2⅜ in:, of longest digit 4¼ in:. Tibia 15-16 in:, Foot with claws ½ in:. Ears anteally, from lowermost base, ⅝ in:.

Geographical Distribution. Central India, Ceylon.

Mr. Blyth notes a peculiarity in the dentition of this species, which he has not seen in any other; viz: it has a short flat obtusely trilobate or quadrilobate second pair of upper incisors, posteriorly to the usual large pair, and immediately behind the contact of each of the latter and the canine of the same side.

GENUS. KERIVOULHA. *Gray.*

Chaffron highly concave, muzzle narrow. Face hairy. Feet hairy above, half attached; the wings arising from the base of the toes. The interfemoral membranes large, pointed, investing the tail, and traversed with cross bands bearing a small tuft of hair beneath.

Dentition nearly similar to that of *Scotophilus.* There are two pairs of upper incisors, of which the inner are longer, and so placed that, on a direct front view, they are alone visible; the second pair being concealed behind them. There are two præmolars of equal size between the upper canine and the carnassier; two below, of scarcely inferior size to the third or lower carnassier. *Blyth.*

KERIVOULHA PICTA. *Gray.*

Syn: Vespertilio Kerivoulha—*Boddaert.*
Vesp: pictus—*Pallas.*
Vesp: ternatus—*Seba?* apud *Cantor.*
Muscardin volant—*Daubenton,* apud *Gray.*

We have some doubts as to the identity of the first (dried) specimen, which we took for *Kerivoulha picta,* and those subsequently met with at Trincomalie. The latter, Mr. Edgar Layard informs us, are identical with specimens he sent Mr. Blyth, and which that naturalist identifies with specimens of *Kerivoulha picta* from Java. We shall therefore first quote Dr. Templeton's description, which at the time we examined the first dried specimen, (partly mutilated,) we thought agreed with its characters.

VESPERTILIO PICTUS, apud *Templeton.*

Back of a bright yellowish red colour; belly yellow; ear shorter than the head, oval, broad at the base, tragus elongate; membrane *brownish red*; along the fingers rayed with citron yellow; length about 1½ inch; expanse 6½ inches.

The above description is taken from Dr. Templeton's published account, which agrees in the colour of the alar membrane given in books, viz: "*chestnut brown.*" In none of the fresh specimens are the wings of a chestnut brown, but jet black in the interspaces between the bright yellow coloured rays. To prevent further misconceptions, we shall give our own description of the bat, which appears to be much larger than the one Dr. Templeton described from, and certainly larger than the dried specimen which first attracted our attention, and which is now unfortunately lost.

KERIVOULHA PICTA. *Gray.*

The painted bat—Kehel-voulha,—*Sing.*

Body, above yellowish ferruginous brown, or as artists would call it yellowish crimson brown. Below fulvous whitish, with a darker yellowish tinge on the sides. Alar membrane black and bright yellow or citron coloured. The former colour (black) confined to triangular spaces between the citron rays along the digits; and on a large triangular space between the last digit and body; the alar membrane adjoining the latter being also citron coloured. Interfemoral membrane wholly citron coloured; above and below the arms also, the same yellow colour prevails, as through the other parts of the membrane already mentioned. Feet hairy; tips of toes brown, the rest yellow. Ears yellow, naked, moderate sized, pointed and emarginated near the apex. Tragus long, narrow, acutely pointed. Sexes alike in colour, females rather smaller.

The largest sized male examined measured, Total length 2. 8-10 in:, of which the tail, composed of 7 or 8 bones, is 1. 4-10 in:. Alar expanse 10 inches. Radius 1. 3-10 in:. Tibia 6-10 in:. Ears 6-10 in: long, anteally. Tragus 4-10 in:. Head 7-10 in:. Foot with claws 3-10 in:. Dentition as in true *Kerivoulha.*

Geographical Distribution of *Kerivoulha picta* Gray. Java, Sumatra, Borneo, Ceylon.

We should have preferred not deciding upon the above described bats, till we had heard from Mr. Blyth, in return to our remarks on the subject; but as the delay would occasion some inconvenience, we have ventured to lay before our friends such account of them as we possess. A gentleman, long resident in the southern provinces, assured us on seeing this bat at Trincomalie, that it is very different from the bat of Galle and its neighbourhood, which is recognised there as the *Vesp: pictus* of *Pallas.* The wings of the bats he examined at Galle had not the black marks; the interspaces were of a dark *red-brown.* Friends at Galle would indeed oblige us, by sending all bats from thence in order to clear up the matter. We may add that the black marks of the Kerivoulha of Trincomalie, even when dried, are not turned into a chestnut brown colour.

Why and wherefore Mr. Gray adopted the term "Kerivoulha" as a generic name, we cannot possibly say, for there are no bats in Ceylon called by the Singhalese *Kerivoulha,* which means milky bat "*Kehel-voulha*" is the Singhalese name for the yellow bats found on plantain trees:—"*Kehel,*" in Singhalese meaning plaintain, and "*Voulha*" a bat. We have never obtained the *Kerivoulha* from any other places, than plantain groves, where they are generally found clinging to the fruit. We should think that, if there is any thing in a name, "*Kerivoulha*" had better be changed into *Kehel-voulha,* or some other more appropriate term used as a generic name for this tribe of bats.

b. Frugivora.

GENUS. PTEROPUS. *Briss. Cuv. &c.*

Vespertilio. *Linn:*

Head long and conical. Ears short, simple; without oreillon. No crest or nasal appendage. Tail short or none; interfemoral membrane little developed, and deeply emarginated or shaved off. An additional phalange and nail on the index finger of the wings. Molars with the crown truncated obliquely, and marked with a longitudinal furrow.

Dental formula. Incisors $\frac{4}{4}$, canines $\frac{1\text{-}1}{1\cdot 1}$, molars $\frac{5\text{-}5}{6\ 6}$, = 34.

PTEROPUS EDWARDSII. *Geoff.*

The flying-fox or Roussette—Loco-Voulha—*Sing.*
Syn: P. medius—*Temm.*
P. leucocephalus.—*Hodgson.*
P. edulis—*Geoff.* } apud *Cantor.*
P. Javanicus—*Desm.* }

Muzzle black. Ears black, moderate size, naked. Head and nape rufous black; neck and upper parts of shoulders golden yellow, darker in the under parts and assimilating with the rufous brown of the abdomen. In some, the back is slightly hoary. Dark brown hairs spread on the interfemoral membrane, as also on the limbs and membranes adjoining. Feet and claws black. Membranes black. Females of a pale colour on the neck.

The largest male we have seen measured,—Head and body 12½ inches. Alar expanse 4 feet, 4 inches.

Geographical Distribution. Mauritius, India, Ceylon, Maldives; and, if Dr. Cantor is right in identifying the Javanese *P. Edulis* with the Indian species, its range extends to Java, Sumatra Assam, Banda, &c.

This large frugivorous bat (the flying Fox of Europeans) is very common throughout the lower parts of the Island; less so in the Kandian provinces, and rarely seen at Newera-Ellia. The depth of colouring varies in specimens from different parts of the Island. The rufous brown variety is more frequently met with: that with a blackish back is the only kind seen at Trincomalie.

PTEROPUS LESCHENAULTII. *Dumeril.* Var, (*apud Blyth.*)

The small flying Fox.
Syn. Pteropus seminudus, *nobis.*

Head and upper parts of body covered with a short downy fur, of a light dull or ash brown colour. Beneath, the fur denser and of a paler brown colour. Tail very short, and its basal half enclosed in the scanty interfemoral membrane. Membranes dark brown. An apparently young specimen measured,

Head and body	5¾	inch.
Head	1½	„
Ears, anteally	¾	„
Tail	¾	„
Alar expanse	20	„
Radius	3	„
Tibia	1½	„
Foot with claws	1	„

Geographical Distribution. Southern India? Ceylon.

The above description is of a bat, presented to us by the Revd Dr. MacVicar, from Mount Lavinia, (on the west coast of the Island.) Since then we have obtained two specimens from Trincomalie, on the North Eastern coast, which we are inclined to consider of identical species; although, the back was in the latter more densely covered with hair, and the alar membrane distinctly white spotted. The largest one measured,—Head and body 4. 8-10 in:. Tail ½ in:. Head 1 in. Fore arm 3. 4-10 in:. Tibia 1. 6-10 in:. Foot with claws 9-10 in:. Ears anteally 8-10 in. The ears had a black margin. The lower incisors bilobed. Dental formula as in genus Pteropus.

If we are not mistaken the same species is found in Kandy: two specimens from thence, we have forwarded to Mr. Blyth, with a number of Cynopteres.

GENUS. CYNOPTERUS. *F. Cuv.*

Four incisors, and two rudimentary false molars in each jaw, like the Pteropi, but they entirely want the last molars. The jaws are abbreviated, and the heads much resemble those of *Cephalotes.* The second or index finger is also, like Pteropus, furnished with a small claw.

Dental formula. Incisors $\frac{4}{4}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{4\text{-}4}{5\text{-}5}$, = 30

CYNOPTERUS MARGINATUS *F. Cuv.*

The margin eared Bat—Coteekan Voulha—*Sing.*

Syn: Pteropus pyrivorous—*Hodg.*
P. Titthæcheilus—*Temm.*
Vesp: marginatus—*Hamilton.*

Head light greyish brown or ash coloured. Ears small, oval, with a distinct white margin. Neck and back light olive brown, with a reddish smear on the neck and shoulders of most specimens. Beneath paler; darker on the sides, where also there is sometimes a rufous shade. Membranes dusky brown. Basal half of the short tail invested in the narrow interfemoral membrane, which is supported, as in Pteropus, by a short tarsal spur. Females paler.

The largest specimen we have examined measured,

Head and body	$5\frac{1}{2}$	inch.
Tail	$\frac{5}{8}$	„
Alar expanse	$20\frac{1}{2}$	„
Radius	$2\frac{3}{4}$	„
Tibia	1	„
Weight	1 oz. and $6\frac{1}{2}$ drams.	

Most individuals are of smaller dimensions.

Geographical distribution, India, Java, Sumatra, and Ceylon.

The Cynopteræ, so common in the Island, vary much in colour, even in individuals found in the same locality. We met at Trincomalie *one* which had nearly a uniform reddish brown colour. The ears and membranes were also deeply tinged with a blood red colour.

Mr. Gray enumerates several species of Cynopteræ in his catalogue of Mammalia in the British museum; and it is quite possible, tha Ceylon may yield more than one species.

Although our list of Ceylon bats is large, let not our successors despair of finding species new to the Fauna of the Island. No species of *Rhinopoma* or *Dysopus* have yet been discovered.

In the appendix will be given descriptions of the additional genera of bats, several species of which have been found in the Indian Peninsula.

FAM: INSECTIVORA.

GENUS. SOREX. *Linn.*

Body covered with soft velvetty fur. Muzzle elongated and attenuated. Ears short, and rounded. Eyes small, but perceptible. Five toes with moderately strong claws on each foot. Tail short, rounded or angular. Sebaceous glands on the flanks and anal region. Teats 6 or 8.

Dental formula: Incisors $\frac{2}{2}$, canines $\frac{0}{0}$, molars $\frac{7\text{to}8}{5}$, $\frac{7\text{to}8}{5}$, $=28$ or 30.

Upper incisors curved and toothed, or notched at the base; lower incisors nearly horizontal; all much produced. From 3 to 4 præmolars in the upper jaw, and two in the lower, with bristled molars on each, and on the upper one a small tuberculous tooth.

SOREX MURINUS. *Linn.*

The common musk shrew—Koone Meeyo.—*Sing.*

Syn. Sorex myosurus.—*Pallas.*
S. Sonnerattii } *I. Geoff.*
S. giganteus }
S. Indicus.—*Geoff.*
S. cœrulescens.—*Shaw.*
S. crassicaudatus.—*Licht.*

Above light bluish grey. Beneath paler. Fur short, with a slight pinkish shade in some. Ears naked, exposed. Legs and feet nakedish. Tail thick, rounded and terminating in a point, nearly nude, of a light flesh colour; and scantily covered with short and long grey hairs. Sebaceous anal glands and pores; from whence issue the strong disagreeable musky odour, for which these shrews are remarkable. Length of head and body, 6 inches and more. Tail 3¼ inches.

Geographical Distribution.—India, Java, Penang, Ceylon.

This is the very common "*musk shrew*" or rat of Europeans. We have not seen this species on the higher parts of the Island. The musk shrew found in godowns at Kandy is a darker and rather smaller animal; and we are inclined to consider it a distinct species and therefore describe as,

SOREX KANDIANUS. *nobis.*

Fur short, ashy brown, with a ferruginous smear on the upper surface. Beneath a little paler coloured. Tail short and not so broad at the base, as in the last species. Ears partially concealed.

Head and body	4¾	inch
Tail	2	„
Skull	1. 2-10	„
Lower jaw	7-10	„

Dentition as in *Sorex murinus.*

Geographical Distribution.—Ceylon.

This shrew is easily distinguished from *Sorex murinus,* from its smaller size and darker colour; odour from it equally offensive.

From the following species of shrews it can be distinguished by its larger size, shorter fur, and more powerful teeth.

This, we believe, is similar to one of the large shrews Mr. Thwaites of the Botanical Garden at Peradenia had in his possession, and which although intended for us, was sent by mistake to London.

SOREX MONTANUS. *nobis.*

Fur above sooty black without any ferruginous smear. Beneath lighter coloured. Whiskers long, silvery grey. Some parts of legs and feet greyish, clothed with adpressed hairs. Claws short, whitish. Ears large, round, naked; outer margin lying on a level with the fur of the head and neck, the ears being thus concealed posteriorly. Tail tetragonal, tapering, shorter than the head and body, covered with short dusky-brown hairs, and among these are scattered longer silky hairs, of which a few are also seen on the posterior and inferior parts of the body. No sebaceous glands visible.

A specimen from Pedrotellagalla mountain (8000 feet) measured,

Head and body	3¾	inch.
Tail	2¼	„
Hind feet with claws	8-12	„

This is the blackest shrew of the highest parts of the Island. It is not identical with the following, as Mr. Blyth was led to suppose, from an inadvertence of our own, in sending him two specimens of the same kind, instead of one of each.

SOREX FERRUGINEUS. *nobis.*

Colour uniform dusky or dusky slate, with the tips of the fur rufescent. Fur rather long. Large sebaceous anal glands; smell very powerful. Nearly of the same size as the last. We omitted to take the measurement from fresh specimens.

This species is found at Dimboola, 1000 feet below Newera-Ellia.

SUBGENUS. FEROCULUS. *n. g. nobis.*

This subdivision of Sorex is allied to Gray's Crossopus, and is distinguished from it by the following characters, to which our attention has been drawn by Mr. Blyth's description of our *S. feroculus.*

Teeth small; the upper quasi-incisors shorter and less strongly hooked than in the typical *Sorices,* with the posterior spur large; the lower quasi-incisors serrated, shewing two depressions, and therefore a row of *three coronal points.* Behind the upper false incisors a series of four small præmolars precedes the carnassiez, the two medial being of equal size, the first rather large, and the fourth smaller; and below are the usual two, inclusive of the carnassiez as in the genus generally. Fore feet with long, and slightly curved claws. Hind feet with claws, 7-8 inch long. The species from which the new sub-division we have ventured to form, may now be called,

FEROCULUS MACROPUS.

Syn. Sorex feroculus.—*nobis.*
Sorex macropus.—*Blyth.*

Fur somewhat long, soft, of a uniform bluish colour, with a slight rufous smear on the upper surface. Beneath rather paler. Tail black except the tip, rounded, tapering; with scattered long hairs; tip naked, flesh coloured. Claws of fore-feet elongated, compressed, acute and but slightly curved; that of the middle digit ¼ inch in length. Ears partially concealed as in *Sorex montanus.*

Geographical Distribution.—Ceylon.

This shrew is found on the plains of Newera Ellia. It is difficult to say, whether it is a "water shrew" or not, as there are so many rivulets crossing the plains; but, we are more inclined to think, that it is a "water shrew," as it was found in the very wet season, near a stream of water. The only live specimen we succeeded in securing, lived in a box for several days, feeding on earth worms, till one frosty night it died. It was not at all a timid creature, and it afforded us considerable amusement by its spirited behaviour on all occasions, and particularly, when a string of worms was brought to it.

At the time we were collecting shrews and rats at Newera-Ellia a few tiny shrews were brought to us, as young shrews; which were put into spirits for further examination, but not one of them was in a fit state for examination on their arrival at Colombo. We are, however, strongly inclined to believe, that they are allied species, or identical with Hodgson's *Sorex pigmæus* found on the plains of Nepal; they were nearly of the same dimensions. The body well clad in fur, colour uniform sooty black, with pale fulvous grey tips to some parts of the fur above. Much paler beneath.

Shrews (*Sorices*) must be very rare in the North-Eastern provinces, for although we have resided at Trincomalie for 8 months, not one of the genus have we seen as yet. The natives, however, say, that they are to be found in the district.. At Colombo there is no scarcity of *S. murinus.* Every house in the town and gravets is infested with them. We think the notion perfectly ridiculous, that the musky odour of some wines is owing to the touch of the outer surface of the bottles by these animals. We should rather say, that the odoriferous particles were insinuated through bad corks; or, what is just as likely, the bottles were unclean before the wine was put into them. * In some species the sebaceous glands are probably only developed at certain periods of the year. Both sexes are furnished with them; and they may serve the purpose of bringing the sexes together.

There are two stuffed specimens of Hedge-hogs in the Army Medical Officers' Museum at Colombo, supposed to be natives of the Island; one we remember seeing alive many years ago, but cannot positively affirm where that came from. Dr. Kinnis, of the Medical Staff, in whose curatorship the specimens were collected, would doubtless be able to give us the information; for which we have applied to him.

A species of *Tupaia* may also be expected to be found in the Island, as a species of this genus has lately been found in Southern India, by that indefatigable naturalist, Mr. Walter Elliot.

FAM: CARNIVORA.

GENUS. URSUS. *Linn. Cuv. Geoff.*

The bears are large and stout bodied animals with short limbs; pentadactyle or five toed feet, and a short tail. They exhibit but small carnivorous developement, and though they are strictly speaking omnivorous, the form of the crowns of their molars indicates a propensity bordering on the frugivorous exclusively. Their claws too are not retractile, and are more calculated for digging and climbing, than for tearing prey. Mammæ six, four ventral and two pectoral.

Dental formula: Incisors $\frac{6}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molar $\frac{4\text{to}7}{4\text{to}7}=32$ to 44.

Illiger, has made a subgenus of Bears with only *four* Incisors in the upper jaw.

SUBGENUS. PROCHILUS. *Illiger.*

Dental formula, Incisors 4-6, the rest as in true Bears. Some of the præmolars, as in the genus *Ursus*, drop off even at an early age.

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* An ingenious friend, atributes the musky flavour of wine, to the shrew smearing over the neck of the bottle its unctuous secretion when nibbling the cork; and wine, when poured out of the bottle thus tainted, becomes impregnated with the nauseous taste and odour.

PROCHILUS LABIATUS. *Blainville.*

The labiated or Sloth bear—Oosa.—*Sing.*

Syn. Ursus labiatus.—*Blainville.*
Ursus longirostris—*Tied.*
Bradypus ursinus—*Shaw,*
Melursus Lybius—*Meyer.*
Ours Jangleur, of the French.
Slow bear—*Hamilton.*

Fur long, of a deep black colour, with some brown spots on the sides and head, particularly in young animals; ears moderate, with brownish hairs. A triangular, or sometimes horse-shoe or semicircular fulvous-white mark on the neck and breast. Muzzle prolonged and the nasal cartilage dilated and capable of extension. Lower lip elongated. Both lips moveable and capable of protrusion. Limbs short, claws yellowish, sometimes black. In adults, very long and shaggy brownish hairs surround the head.

Geographical Distribution.—India, Ceylon.

This uncouth looking animal, is very rarely met with on the higher parts of the Island; but is very common in the maritime provinces; particularly in the Northern and Eastern parts of the Island. Between Putlam and Aripo, we have seen them in great numbers. They appear to shun human habitations; they are seldom known to attack man, but in self-defence. Their food consists of fruits and ants; they are also said to climb up trees in search of honey.

Our own observation of several skulls of bears of Ceylon, confirms the statement of Colonel Sykes, Mr Walter Elliot, and others, that they have only *four* incisors in the upper jaw, and that this system of dentition does not depend upon the age of the specimens, but that the young too exhibit the same. Mr. Elliot mentions that the Indian bears carry their cubs on their back. Native testimony assures us of the same maternal regard in the Ceylon bear.

GENUS. LUTRA. *Storr.*

Head compressed; eyes rather large; ears very short; whiskers very stiff. Tongue rather rough. Body very much lengthened. Legs short, the feet with five toes and webbed. Tail long, flattened horizontally, and covered with short hairs.

Dental formula: Incisors $\frac{6}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{5\text{-}5}{5\text{-}5}$, $=36$.

LUTRA NAIR. *F. Cuv.*

The Indian Otter—Deeya Balla—*Sing.*

Syn. Lutra Indica. *Gray.*

Fur above, dark chesnut; lighter on the sides. Beneath, dusky white. Hair short with scattered longer ones. Lips and chin white. Muzzle bald. Soles of the fore feet bald, posterior half of the hind soles hairy.

The largest specimen we have examined measured; head and body 28 inches in length. Tail 20 inches, (specimen in the Colombo Museum.)

Geographical Distribution.—India, Malayan Peninsula, China, Ceylon.

We are inclined to believe, that there are two varieties of the Indian Otter in Ceylon;—a large and a small kind. In the Army Medical Officers' Museum, there are specimens of two distinct shades of brown, one much lighter than the other. We have just been informed by Mr. Palliser of Dimboola, that he has at last captured an otter near Newera Ellia, which he has promised to send us. We have not examined one from so high an elevation. Otters found in the lake of Kandy are identical with those found in the Colombo lake.

GENUS. CANIS. *Linn. Cuv. Geoff.*

Muzzle elongated; tongue soft; ears erect. Fore-feet pentadactylous, hind feet tetradactylous; Teats inguinal and ventral.

Dental formula: Incisors $\frac{6}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{6\text{-}6}{7\text{-}7}=42$.

The three first molars in the upper jaw, and the four in the lower, small, edged; the great carnivorous tooth above bicuspid, with a tubercle on the inner side; two tuberculous teeth behind each of the large carnivorous ones.

CANIS AUREUS. *Linn.*

The Jackal—Nareeah.—*Sing.*

Syn. Canis micrurus. *Reichb.*

Head greyish brown; whiskers black; under the chin and neck grey. Back of the ears and legs reddish brown. Inner side of thighs of a lighter reddish brown. Back mottled black, grey and brown; under fur yellowish-brown; single hairs annulated black and grey or brown and grey; tips of most black. Lower parts yellowish grey, or brown. Tail reddish or yellowish brown, and terminating in a black, bushy pointed tuft, reaching to within an inch of the knees.

A large specimen, found at Newera Ellia, from which the above description is taken, measured,

	ft.	*In.*
Head and body	2	6
Tail	0	10½
Head	0	7¾
Height at shoulders	1	4½
Do. at haunches	1	5½

Small intestines, 9 feet, 10½ inches; large intestines, 1 foot, 1 inch; cœcum, 5 inches.

Gegraphical Distribution.—India, Ceylon.

Jackals are very common throughout the Island; the low country animal is of a smaller size, and of a more silvery grey colour on the back than the highland Jackal. Even at Newera Ellia there are individual varieties of them, which incline one to think there are more than one species in Ceylon. Sportsmen report that they have seen Jackals hunt the smaller quadrupeds, and some parties have informed us that the Jackals hunt even deer. The hunter finds Jackals not bad substitutes for the Fox.

There are no wild dogs in Ceylon. Foxes are said to have been seen in the Badulla District; and a species of Fox, we hear, was sent to England by Dr. Templeton, but this requires confirmation. The native hunting dog (not the common Pariah dog) is a strong robust animal, and Europeans are known to mix a few of them in a pack of higher bred dogs, when, frequently, they will be seen following the lead. Native hunters in the Trincomalie district have small packs of these dogs which they use in hunting hare, deer, monitors, &c. It would be worth while to improve this breed of dogs, as hounds from England do not thrive in the maritime provinces.

GENUS. VIVERRA. *Linn:*

Head long; muzzle pointed; feet pentadactyle; claws semi-retractile; anal pouch more or less deep, situated between the anus and genitals, divided into two bags, filled with an unctuous substance of a strong musky odour. Pupil vertical, oblong. They are arboreal as well as terrestrial animals.

Dental formula. Incisors $\frac{6}{6}$ canines $\frac{1\text{-}1}{1\text{-}1}$ molars $\frac{6\text{-}6}{6\text{-}6}$, = 40.

VIVERRICULA. *Hodgson.*

Size small, scansorial, habit vermiform; nails more or less raptorial; and thumb remote; pouch as in *Viverra.*

VIVERRICULA MALACCENSIS. *Gmel.*

The Indian Genette—Ooralawa—*Sing*:

Syn: Viverra Malaccensis—*Gmel.*
V. Indica—*Geoff.*
V. Benghalensis—*Gray.*
V. Rasse—*Horfs.*

Fur rather long, stiff; under fur soft. General colour greyish brown. Upper part spotted black. Dorsal spots unite and form four to six, or seven, irregular streaks on the crupper. Sides and limbs have also short interrupted black lines or spots. Head darker brown, mixed with grey. One long longitudinal black streak runs from ear to shoulder, and between these, there are two or three indistinct lines. Transversal black bands on sides of neck. Abdomen nearly spotless. Feet, and part of legs, brown. Tail long, pointed; with 8 or 9 perfect black rings; tip of tail and spaces between the black rings, grey. The largest specimen examined measured,

Head and body	23½	inches.
Tail	17	„

Geographical Distribution. Malayan Peninsula, Philippine Island, India, China, Ceylon.

The *Rasse,* or "Civet cat" of Europeans in Ceylon, abounds in all parts of the Island. Those of Newera-Ellia are larger and of a lighter grey colour. There is a variety in the Army Medical Officers' Museum, in which the dorsal spots are not united on the crupper. The Rasse has frequently been mistaken for the *Viverra Zibetha,* from which it is distinguished chiefly by its longer head, pointed tail, with *perfect* black rings; no mane. It is not unlikely that the true *V. Zibetha* L., or the allied species, *V. tangalunga,* Gray, may also exist in Ceylon. Nothing, however, we have yet seen in the Island can be identified with either. Mr. Edgar Layard enumerates the *V. Zibetha* as one of the Ceylon animals, and says it is common at Jaffna; but as our friend does not mention the *Viverricula malaccensis* as inhabiting the Jaffna Peninsula, we are strongly inclined to think that his *V. Zibetha* is the Rasse, which we know from good authority is found in the Northern provinces, and is also very numerous in the North Eastern district. Natives keep it in cages for the sake of the musky fluid its anal pouches secrete. When young they are docile. In a wild state they are great destroyers of poultry, and will enter the poultry yard even during the day, and carry off a fowl or duck.

GENUS. PARADOXURUS. *F. Cuv.*

Generic character generally that of the Civets and Genets. Tail capable of being rolled from above downwards to its base; but not prehensile. Toes 5, nearly palmated; soles of the foot tuberculous applied throughout its surface to the ground. Claws semi-retractile. Pupil elliptical. No pouch.

The tail is very peculiar, as long as the body; and depressed, not to say flattened above and below; the extreme or more distant half, is when extended turned over, so that the lower side is uppermost, and the animal can roll it up spirally from above downwards, and from the extremity to the base. Hence the designation "Paradoxurus."

PARADOXURUS TYPUS. *F. Cuv.*

The Palm Cat—Oogoodova—*Sing.*

Syn: Viverra Nigra—*Desm*:
V. hermaphrodita—*Pallas.*
Platyschista Pallasi—*Otto.*
Viverra Indica? apud—*Layard.*

General colour fulvous grey, washed with black. Face darker coloured, with four white spots, one above and one below each eye; the latter more conspicuous. From three to five, more or less interrupted, black lines run from shoulder to root of tail. The central one broader and more distinct that the lateral lines. Some indistinct black spots on the sides and upper parts of limbs. Tail nearly all black. Feet black Soles bald to the heel, flesh coloured.

A full grown male measured,

Head and body	20	inch.
Tail	19	„
Greatest circum: of body	13	„
Circumference, at the shoulders	11	„
Height, at the shoulder	10	„
Palma	1¾	„
Planta	2¾	„

Liver deeply cleft into 7 lobules. Gall bladder, 1 inch, long. Heart 1¾ inch, long. Spleen narrow, 3 inch long. Kidney, 1¼ inch, long; and ¾ inch, broad. Æsophagus, 11 inch. Stomach 4 inch. Small intestines 5 feet, 4 inch. Large intestines 9 inch. Cœcum, pointed, ¾ in. long.

Geographical Distribution. India, Ceylon, &c.

Specimens vary in the depth of colouring; some are of a very black colour, others have less of the tawny or fulvous tinge. In captivity all become paler, and those kept long in a cage lose almost all the black hairs. Young animals are generally nearly all black. Muzzle flesh coloured. The white spot behind the ear is developed at a later period; a black line from the vertex of the head to the nose is almost always present in adults.

This Paradoxure is very common in the highlands, and in the Western and Southern Provinces. It would appear to be rare in the Northern parts of the Island. We have not seen a single specimen of it from Jaffna * or Trincomalie. This Paradoxure is more arboreal than terrestrial. At Colombo it frequents roofs of houses, and lodges during the day on trees; particularly on Cocoanut trees. Its habits are nocturnal; during the day it sleeps rolled up in a ball. It can live for months in confinement solely on vegetable food, and will also feed ravenously on flesh of all kinds, but birds seem to be more relished by those not long from the jungle.

PARADOXURUS ZEYLANICUS. *Schreber.*

The golden Paradoxure—Coolla-Weddah—*Sing.*

Syn: Martes Philippensis—*Camel.*
Viverra Ceylonica—*Pallas.*
V. Ceylonensis—*Bodd.*
Paradox: aureus—*F. Cuv.*
P. Philippensis?—*Temm.*

Head elongated, muzzle rather short, blackish. Lips black externally. Ears small, dark brown, hairy externally, and almost naked on the inner surface. Whiskers white, long and rigid. A few long rigid grey hairs on the superciliary region. Colour of head and legs dark brown. Upper parts of the rest of a golden brown colour. Beneath paler. Fur dense, short, moderately long, glossy.

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* Since writing the above. Mr. Layard has sent us for identification a "*Genette,*" from Jaffna, which turns out to be the Paradoxurus typus. This then must be the cat which Mr. W. Ferguson, in his valuable monograph on the Ceylon Palmira, speaks of, as the consumer of *Palm Toddy,*—a fact well established.

Three inconspicuous brown dorsal streaks, diverging and terminating on the crupper. Some very indistinct brown spots; seen only in some lights. Tail long, cylindrical, tip rounded; lighter coloured than the body. Limbs darker brown, soles blackish, nearly bald to the heel. In females an orbicular flat glandular naked surface surrounds the vaginal entrance. Two pairs of mammæ, the fur round the posterior pair of a reddish hue.

A full grown female measured,

	ft.	*In.*
Head and body	1	7
Tail	1	3½
Head	0	5
Breadth of head, at vertex	0	3
Height, at the shoulder	0	8

Stomach, 5½ inch, long; small intestines, 10 feet; large, 6 inches; cœcum 1¾ inch, abruptly terminating in an acute point. Kidney, 1¼ in. long, and ¾ inch broad at its inferior part, and ½ inch broad at its superior termination. Stomach with a distinct pyloric portion.

Geographical Distribution. Philippine Islands? Ceylon.

Specimens have hitherto been received from the highland districts, and from the South and West Coasts. Those from the mountains, are frequently larger, and of a darker golden brown colour. A blackish brown variety has also been seen at Newera-Ellia which we shall distinguish as

VAR.—*fuscus.* (*Paradoxurus montanus, n, b.*)

Smaller than the generality of the above ordinary variety. The fur of a darker fulvous brown, with terminal third of hairs of a dark beetle brown colour, giving a uniform rich dark brown surface colour to the animal, which seen in some lights, throws off a few still darker shades, or very inconspicuous spots; no trace of dorsal streaks. The tail paler, with a rich golden-yellow subterminal ring, which in the dried specimen has become partly albescent.

	ft.	*In.*
Head and body	1	7½
Tail	1	5
Head	0	4½
Height at the shoulder	0	7

Stomach 4½ inch. Small intestines 7 feet 4½ inch. Large intestines 6½ inch. Cœcum 1¼, pointed.

If our recollection of the golden Paradoxure in the British museum is correct, we do not think our Ceylon animal identical with it. The latter is a darker animal, and the dorsal streaks are more evident on it. Mr. Gray will soon have an opportuntiy of deciding, as we have sent to the British Museum our best specimens.

The golden Paradoxure appears to be a more frugivorous animal than the Palm cat (*Paradoxurus typus.*) Their habits are alike, nocturnal and arboreal. In all the individuals of the former species, examined at Newera-Ellia, the stomach contained Cape gooseberries; (*Physalis Peruviana*) which grow there now, in great abundance; and only one, had the remains of animal matter in the stomach. When young they are tolerably docile, but as they grow up their natural ferocity returns.

GENUS. HERPESTES. *Illiger.*

Mungusta. *Olivier.* Ichneumon. *Geoff.*

Feet short, with five demipalmated toes, armed with claws, which are slightly retractile. Tongue furnished with horny papillæ. Ears small. A voluminous simple pouch, which does not contain odoriferous matter, and at the bottom of which the vent is pierced. Body very much elongated. Tail long, broad at the base. Hairs of the fur annulated.

Dental formula: Incisors $\frac{6}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{5\text{-}5}{5\text{-}5}$,=36.

HERPESTES GRISEUS. *Sykes.*

The grey Mungous ....Moogatea.—*Sing.*

Syn: Ichneumon griseus—*Geoff.*
Herpestes pallidus—*Schinz.*
H. Edwardsii—*Fischer.*
Viverra mungos—*Linn.*

Colour greyish brown, grizzled. Single hairs long, annulated with brown and white, or grey. Muzzle brown. Feet brown. The largest specimen examined measured in length, 2 feet 8 inches, of which the tail was 11 inches.

	ft.	*In..*
Small intestines	3 —	5
Large do.	0 —	6
Cœcum	0 —	1¼

Stomach 4½ inch, with a distinct pylorus.

Geographical Distribution. Malayan Peninsula, India, Ceylon.

This is the most common species of Mungous found in the Island. We have not seen it from higher parts than Kandy and places of similar height. Its habit of attacking with impunity snakes and other reptiles, in common with other species, is too well known to require description.

HERPESTES VITTICOLLIS. *Bennett.*

The streaked Mungous, or Elliot's Mungous.......Loco Moogatea—*Sing.*

Syn: Mungous vitticollis—*Bennett.*

Head elongated; muzzle flesh coloured; long, extending to nearly an inch beyond the lower lip. Colour of the head brown, grizzled. Ears small, concealed partially by hairs of the head. Under surface of the head, greyish brown, grizzled. Upper surface, partly brown and partly reddish yellow: a broad black streak runs from the ear on the side of the neck. The general colour of upper part of the body, is of a bright reddish yellow. Lower parts greyish brown, and slightly ferruginous near the hind legs. Under fur yellowish brown. Long hairs, annulated black and grey, and terminating in long yellowish red points, which give the prevailing hue to the body. Tail bushy at its base, of a reddish colour, and terminating in a black point, three or four inches long. Legs blackish. Feet black. Soles nearly bald to the heel; one large pad in front, and one posterior to its inner side.

Mr. Bennett, has made a distinct genus (Mungous) of this species, as in the specimens he examined, there was an additional molar; but which we have not observed in *all* specimens.

A female captured at Newera-Ellia measured,

	ft.	*In.*
Head and body	1	9
Tail..........................	1	½
Head........................	0	5
Length from apex, of muzzle to anterior angle of the eye	0	1¾
Do. from posterior angle of the eye to ear..............	0	1½

	ft.	*In.*
Breadth between the anterior angles of eyes ..	0	1
do. do. the posterior do	0	1¾
do. do. the ears.................	0	2

Height, about 6 inches.—Small intestines, 6 feet 10 inch; large intestines, 10 inch. Cœcum, 2 inch; narrow, tapering to an acute point. Stomach with a distinct pylorus, 5 inches. Spleen, 4 inches. The rest as in *Herpestes griseus*.

Geographical Distribution.—Southern India, Ceylon.

This large, handsome species of Mungous is found in the higher Kandian provinces; and rarely in some of the maritime provinces.

One was lately shot at Kandelay, about 25 miles from Trincomalie. This individual was of a paler colour; and though dentition showed full growth, it was considerably smaller than the specimens obtained at Newera-Ellia, where it is known as the Ceylon Badger; its long bushy fur giving it the shape of that genus. We have not thought it necessary to separate this species from Herpestes, till we have ascertained whether the following one has equal right to it, in the opinion of Mr. Gray and others.

HERPESTES RUBIGINOSUS. *nobis.*

Reddish Mungous—Deeto—*Sing.*

Syn: Herpestes Ellioti?—*Blyth.*
Herpestes Smithii? var—*Gray.*

Reddish ferruginous brown. More of the red on head and outer sides of legs. Hairs annulated black and white, and terminate in long reddish points. Muzzle long, flesh coloured. Sides of nose and circle round the eyes of a light rusty colour. Feet black. Tip of tail black.

A male specimen measured,

	ft.	*In.*
Head and body	1	3
Tail	1	½

Stomach, 4½ inches; small intestines, 4 feet, 10 inches; large intestine, 9¾ inches; cœcum, 1½ inch.

Geographical Distribution.—Southern India, Ceylon.

We are indebted for the first specimen of this species to Mr. Cassie Chitty, District Judge of Chilaw. Since then, we have seen others from Galle in the Southern province; they were larger than the one from Chilaw; and, we believe, they were sent by Mr. Grace to the Zoological Society of London. We kept the former alive for several months; the reddish colour of its hairs became in time paler; some parts nearly lost it. This specimen we have since forwarded to Mr. Blyth, who publishes a description of a species (subsequent to our description read before the local Asiatic Society) which he thinks is identical with this. If Mr. Blyth's opinion, advanced before he saw our specimen, is confirmed, we shall gladly substitute the specific name given to it by Mr. Blyth in honour of Mr. Walter Elliot; although, we think it may lead to subsequent error, as *H. Vitticollis* is already known as Elliot's Mungous. Mr. Elliot in his interleaved Catalogue, which he so obligingly sent us, enumerates "*two additional*" new species, viz. "*H. Monticolus* and *H. torquatus*." If either of these is identical with *H. rubigonosus,* nobis, or *H. Ellioti,* Blyth, it would be preferable to retain the name given to it by Mr. Elliot.

The next species too, may be one of Mr. Elliot's; but as there is no description, we shall give our own.

HERPESTES FLAVIDENS. *nobis.*

Yellow Mungous—Ram-Moogatea—*Sing.*

Syn: *H.* Auropunctata? var—*Hodgson.*

Yellow brown. Hairs annulated with brown and yellow; tips yellow. Tip of tail of a reddish colour. Muzzle blackish, chin flesh coloured. Face brown, slightly ferruginous. Ears fulvous, thickly clothed with hair. Feet blackish.

A full grown male measured,

	ft.	*In.*
Head and body	1	4½
Tail	1	0¼
Planta	0	¾
Palma	0	1¾

Small intestines, 4 feet, 5 inch; large, 7½ inch; cœcum, 2 inch, terminating in an acute point. Stomach and pylorus, 4½ inch.

Geographical Distribution.—Ceylon, Southern India?

This species resembles in shape and size, the more common *H. Griseus.* It appears to be also of much larger size than Hodgson's *H. Auropunctata* (J. A. S. B.,) found in Nepal. It is easily distinguished from all other species in Ceylon, by its almost uniform yellow, grizzled coat. We obtained from Newera-Ellia a much darker variety of this species or a distinct species of nearly an olive brown colour. This too, we have either sent to Mr. Blyth or to the Zoological Society of London.

The habits of all these species are alike, feeding on reptiles and smaller quadrupeds; and they will not object even to a bird; but snakes seem to be their favorite food.

GENUS. FELIS. *Linn. Cuv.*

Five toes on the fore feet, hind feet tetradactyle; nails retractile. Head short; four molars on each side of the upper jaw, the last tuberculous very small; three in the lower jaw. Ears large pointed; claws retractile.

Dental formula: Incisors $\frac{6}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{4\text{-}4}{3\text{-}3}$, $=30$.

FELIS LEOPARDUS. *Schreb.*

The Leopard—Cooteah—*Sing.*

Syn: Felis Panthera—*Exel.*
F. antiquorum—*Fischer.*
F. chalybeata—*Herm.*
F. Pardus—*Linn.*
F. varia—*Schreb.*
Leopardus varius—*Gray.*

Ground colour, above fulvous or tawny brown. Chin, neck, breast, abdomen and inside of limbs, white. Upper parts marked with rows of imperfect rings composed of two, three, or four black spots; these spots are arranged in various shapes on the dorsal region and sides. On the head and part of medial line of the back and limbs, there are full black spots of various shapes, from circular to oblong. Tail spotted black, and terminating in a black point. *Irides* yellow. Female smaller, but similar in colour and spots.

The largest specimen examined measured,

	ft.	*In.*
Head and body	3	4
Tail	3	2
Height at shoulders	2	4

Geographical Distribution.—India, Malayan Peninsula, South of Africa, Ceylon.

This Leopard (the Chetah of Ceylon) varies much in colour in different specimens; some have very little of the fulvous tinge, others are dark tawny. In size too, they differ. The natives distinguish two varieties;—a large and a smaller kind. We have not seen many fresh specimens, nor many stuffed ones to judge from. Certainly, there are vast differences in the size of flat skins of recognised adult specimens; and, therefore, we may reasonably conclude, that the two distinct varieties of *Felis Leopardus*, which Mr Walter Elliot describes, exist also in Ceylon. The larger, he says, "is a taller, slighter, more active animal, exceedingly strong and fierce. The other is smaller and stouter; and varies much in size, some being not bigger than a large tiger-cat." There is also another variety, which cannot be considered as permanent or extensive; as dams have been seen, with cubs of both kinds; and, therefore, this variety, the *F. melas* of Peron, must be considered only an individual variety of *F. leopardus*. The ground colour is a dark brown, almost black; the blacker spots are only visible in some lights. They are very rare in the Island. We have seen only the flat skin of one, which Mr. Kenneth Mackenzie, Assistant Colonial Secretary, shot at Badulla. So rare is this black leopard, that the oldest Kandian in the district, remembered having seen only one other before; and that one was presented alive to the Kandian monarch, as one of the greatest curiosities in his dominions. The existence of *Felis Jubata*, (the true hunting leopard of India) in Ceylon, has not yet been confirmed. *See appendix.*

FELIS VIVERRICEPS. *Hodgson.*

The tiger cat—Handoon deeva—*Sing.*

Syn. Felis viverrinus.—*Bennett.*
Leopardus viverrinus.—*Gray.*
Leop: celidogaster. *Temm.* apud, *Gray.*

Face subviverine; small ears; short tapering tail reaching one inch below os calcis. Above fulvous grey brown. Beneath, and inside of limbs, hoary. From the eyes to the root of the tail, four subcontinuous black lines, two more parallel to and without them, from the eyes to the shoulders; two perfect bands around the jaws from the eyes; and three round the front of the neck and breast. Ears black outside, with a large grey central spot, and rufous hoary on the inside. Body and limbs wholly covered with roundish full black spots, having a sublinear disposition from the head towards the tail; the feet only, from the *os calcis* and top of the *carpi*, being immaculate. The tail exhibits above and below the ground colour of the body, on the upper surface, six or seven transverse bands; the two or three next the body, composed of dots, arranged linearly, and the terminal one being large, forming a blackish tip to the tail on that surface (Hodgson J. A. S. B. 1836.)

The largest specimen examined measured,

Head and body	34½ inches
Tail	11¼ „

Geographical Distribution.—India, Ceylon.

This tiger cat is common, except on the highest parts of the Island. As it is often taken for a "*young chetah,*" we have given Mr. Hodgson's full description, instead of a short one we took from a specimen obtained at Kandy, which Mr. Blyth identified with *F. viverriceps.*

As there is so very little of the viverrine character in the shape of the animal, another specific designation must sooner or later be adopted, and none perhaps will be more appropriate than the name of the industrious naturalist Mr. Hodgson, who first described or named the animal as *Felis viverriceps*; if Indian Zoologists do not in the mean time adopt the name given to it by Temminck.

FELIS RUBIGINOSA? *I. Geoff.*

The Red-spotted cat—Coolla deeva—*Sing.*

Fur short, soft; above, ferruginous greyish brown; under fur, lead colour. Beneath, and inside of limbs, white. Head rounded like that of a domestic cat. Sides of nose and under the eyelids whitish. Whiskers long, white, with a few shorter black bristles; a few short, stiff, grey superciliary hairs. Ears moderate, hairy outside, and a short pencil of hair from the inner edge. On the forehead, nape and between the shoulders, four or five irregular dark ferruginous brown, or blackish longitudinal streaks. A dark brown streak from the posterior angle of the eye to cheek, and another below this. Short, longitudinal, dark ferruginous brown streaks and spots on the crupper, sides of body and outer part of limbs; some of the streaks on the latter nearly black. On the inner part of limbs, two or three broad transverse black streaks, with brownish reflections. Large brownish black spots on the white abdomen. Under surface of neck with transverse ferruginous brown streaks. Tail short, ferruginous brown, and indistinctly spotted or ringed, with darker brown. Feet yellowish brown superiorly, and posteally black; claws retractile.

	ft.	*In.*
Head and body	1	4
Tail	„	9½

Small intestines, 3 feet. Large intestine, 5 inches. Cœcum, ⅜ inch.

Stomach, 5 inches. The remains of a rat in the stomach of the specimen examined.

Geographical Distribution.—India, Ceylon.

This cat is not very common in the Island; we have not seen one from the Northern provinces. The specimens from Newera Ellia are darker coloured, and the body and limbs more maculated. Females paler, and less maculated.

FELIS CHAUS. *Guldenst.*

The chaus, or Lynx-like cat.

Syn. Chaus Lybius } *Gray.*
Felis affinis }
Lynchus erythrotus.—*Hodgson.*

Mr. Layard has recently sent us an imperfect flat skin of a cat, which must be closely allied to *Felis chaus*, if not identical with *Lynchus erythrotus*. The general colour of Mr. Layard's specimen is bright fulvous. Ears large and slightly pencilled at the tip with black hairs; back of ear of a reddish colour. Feet yellowish red, soles black. Transversal brown stripes on the upper part of limbs. Back mottled with black; long hairs annulated black and bright yellow; those of the sides black with fulvous tips. Beneath, uniform pale fulvous. Tail at the base covered with hairs of nearly the same characters as those of the back; lower two-thirds with three black rings, and tip black. Length of tail about 9 inches; of head and body apparently 22 inches. Found at Jaffna. Mr. Blyth also speaks of an imperfect skin of *F. chaus* sent to him by Mr. Layard.

Supposing our identification to be correct, we shall still have three feline animals wanting, viz. *Felis tigris, Felis bengalensis* and *Felis jubata,* to complete the identity of the Ceylon Feline Fauna with that of Southern India.

ORDER. RODENTIA.

FAM: SCIURIDÆ.

GENUS. SCIURUS. *Linn. Cuv.*

Profile of the face nearly straight, a slight depression on the frontal bones, and a very slight posterior projection on the same. Cranial cavity as long as two-thirds of the head. Four toes to the fore-feet, and a tubercle or rudimentary thumb. Hind feet pentadactyle. Tail distichous; i. e., the hairs grow laterally so as to resemble a feather. Two pectoral and six ventral mammæ.

Dental formula: Incisors $\frac{2}{2}$, canines $\frac{0}{0}$, molars $\frac{5\text{-}5}{4\text{-}4}$, $=22$.

The cranial formation of the Palm squirrel, approaches more to that of the Genus *Tamias*, (ground squirrel) than to any other. The central cavity but little extended, and advancing to only one-half of the skull. The skull presents a uniform curved line on its upper part, when viewed in profile; and offering, when seen from below, a very slender condition of all the anterior parts. The late Mr. Bennett, was of opinion, that a new genus ought to be formed of the palm squirrels; of which, there are so many species in India and Ceylon, whose habits are both arboreal and terrestrial. If we were prepared to make a new genus, "*Leyna*," the Singhalese word for these little rodents, would not be an inappropriate term for adoption.

SCIURUS MACROURUS. *Forster.*

The common Rock Squirrel—Rookeeah, or Dandoleyna—*Sing.*

Syn. Sciurus Ceylonensis.—*Boddaert.*

Fur of the upper parts, coarse and slightly waved; above, the colour varies from maronne black to rufous brown; hairs sometimes grizzled and tipped white, or pale yellow; particularly on the croup, sides and upper parts of limbs. Crown of the head darker in most specimens than other parts. Cheeks, under parts and lower two-third of limbs of a fulvous white. Occiput of a deeper fulvous; sometimes yellow or ferruginous brown. An indistinct dark spot on the cheek; which is sometimes absent. Two-thirds or more of the basal portion of the tail black or brown; the rest grizzled grey or fulvous. In some the hairs of the whole tail are tipped white; and in others grizzled white throughout. In the young, there is very little of brown or black; the whole tail is more or less formed of grey hairs; and the terminal third is nearly white. Grey is also the prevailing colour on the posterior half of the body. Toes in all, black or blackish brown. Ears hairy, only slightly tufted in adults.

Head and body	13½	inches
Tail	11	„

Large intestines, 3 feet, 2 inches; small intestines, 7 feet, 7 inches. Cœcum, 9 inches. Stomach, 5½ inches.

Geographical Distribution.—Southern India, Ceylon.

Few animals vary so much in colour, as this squirrel; and this, no doubt, has led the older naturalists to include this Indian species, among some of the Malayan forms. Mr. Blyth, who has seen a number of specimens from Ceylon and India, separates this species from *S. bicolor* and *S. javensis*. Schreb.; and reserves *S. macrourus* of Forster, for the above described Ceylon squirrel, which according to Mr. Walter Elliot exists also in Southern India. In India too, the same individual varieties are observed. It is not, perhaps, generally known, that this squirrel changes its coat. We have seen it, in its transition state, from dark brown to grizzled grey. In one live specimen, in the possession of Mr. Casie Chitty, one-half of the upper part of the body, was nearly black, and the other half was light brown; the latter part was, as that gentleman assured us, also black a few months before. This peculiarity made us formerly suppose, that the next species was only a black variety of *S. mocrourus*. This we have now reason to believe is not so; and, therefore, we describe it as a distinct species, confined to the higher parts of the Island and rarely seen at Kandy, where the other species is found in great abundance.

SCIURUS TENNANTII. *Layard.*

The large black squirrel—Kalloo Dandoleyna—*Sing.*

Syn. Sciurus bicolor? var? apud *Blyth.*
S. macrourus. var, montanus. *nobis.*

Muzzle and chin, flesh coloured. Cheeks fulvous grey; with a large triangular black patch behind the eye, reaching upwards to the ear. Between the ears a rusty-red spot. Upper parts of the head, neck, and body entirely black. Fur less wavy than in the former species, and more glossy. Beneath, and round the limbs fulvous white. Tail, generally, all black with a rusty tip; in some, slightly grizzled with white; more frequently two-thirds of the tail is grizzled. A narrow grey line, composed of short grey hairs, is seen in the medial line of the under surface of the tail; which is less conspicuous in *S. macrourus.* Forster.

Head and body	15 inches.
Tail	13 „

Geographical Distribution.—Ceylon, Southern India, (Mr. W. Elliot.)

This is a larger squirrel than *S. macrorus,* and readily distinguished from it, by the prominent black colour of the whole upper surface of the body, with the exception of the rusty spot at the base of the ears. Mr. Edgar Layard, was the first naturalist to have observed this species, which he called after the late Colonial Secretary Sir James Emerson Tennant, who paid some attention to the natural productions of the Island. This squirrel is found in great abundance at Newera Ellia. *S. tennantii* and *S. trilineatus* are the only species of squirrels seen at that elevation.

Mr. Blyth, in noticing this squirrel, observes, that it is distinguished from *S. bicolor,* by the white surrounding all the limbs. In *S. bicolor,* the posterior limbs are wholly black externally, and the anterior are wholly black behind, and more or less so externally.

SCIURUS TRISTRIATUS. *Waterhouse.*

The Palm squirrel—Leyna—*Sing.*

Syn. Sciurus penicillatus. *Leach*

The general tint of the upper parts of this squirrel is usually rusty red on the head; greyish over the shoulders; black on the middle of the back; and of a rust colour over the haunches. The sides of the face are yellowish-rust colour; the sides of the body, the feet and the outside of the fore-legs are grey; the outer portion of the hind legs is grey with a yellowish and sometimes rusty tint; the chin, throat, under part of body, and the inner sides of the limbs are white. The rump is of a deep rust colour, and so likewise is the under side of the tail at the base. A longitudinal white or yellowish line extends from the occiput along the middle of the back, nearly to the root of the tail; over the shoulders and haunches this line, however, is scarcely to be traced, and sometimes is quite obliterated; parallel to, and on each side of this pale line, is another, which commences a little behind the ear, and extends to the root of the tail; over the shoulders, it assumes a grey cast, and is very indistinct; and on the hinder part of the body it is frequently of a deep yellow tint; the intermediate portion is generally white; the distance between this and the central line is about five lines, and the intermediate space is occupied, in some specimens, almost entirely with black hairs; and, in others, the hairs in the same part consist of a mixture of yellow or rust colour, and black. These last pale lines are bordered externally by a dark stripe, which is in most cases totally black, and extends only along the middle portion of the body or flanks.

The hairs on the upper side of the tail are most of them white at the apex, of a deep rust colour at their base, then, annulated with black, rust colour and black. The greater portion of the hairs on the under side of the tail have their basal half rusty-red; the apical portion white, with an intermediate black space. The ears are covered externally and internally with minute yellow and black hairs.

	In.	*Lines.*
Length from the nose to the root of the tail	7	5
Do. ———— to the ear	1	7
Do. of tail, to end of hair........................	7	5
Do. of naked part of forefoot beneath, to end of claws	1	„
Do. of tarsus, to end of claws	1	7¼

Geographical Distribution.—India, Ceylon.

It so happens, that at the time we are writing on the *Sciuridæ*, we have no fresh specimen of the *S. tristriatus* of Colombo, from which to give a correct description; and, therefore, we have given Mr. Waterhouse's elaborate description instead of our own short one, taken down when we did not contemplate bringing out a book on Ceylon Mammals. This we do the more gladly, as to Mr. Waterhouse is due the credit of having separated this species from *S. palmarum* of Buffon, with which it was before confounded; and, we think, that having given this full description, our friends will be the better able to appreciate the difference, if any really exists, between the *S. tristriatus* of Colombo and the other varieties or species found in the Island. We are strongly inclined to believe, that all the following species, with the exception of the last (S. trilineatus.) are only local varieties of *S. tristriatus* of Waterhouse. See appendix, for a description of *S. palmarum*, verus; which, although co-existing in Southern India with *S. tristriatus*, has not yet been observed in Ceylon.

SCIURUS BRODIEI. *Blyth* and *Layard.*

Very similar to the last, but distinguished by its considerably paler colour; and, especially by having a very long pencil tuft (3½ inch,) at the extremity of the tail; quite different from what is ever seen in *S. tristriatus*. Beneath the tail, to near its tip, ferruginous as in the other species. *Blyth.*

The only specimen we have seen of this squirrel, was one Mr. Edgar Layard sent from Point Pedro. The dorsal lines in this, stopped on the shoulders, and were not continued over the neck. The long pencil tuft was absent. This Squirrel, according to Mr. Layard, extends from Putlam to Jaffna. It is called after Mr. Brodie, of the Ceylon Civil service, who has contributed specimens from Ceylon to the Bengal Asiatic Society's Museum.

SCIURUS LAYARDI. *Blyth.*

Size of the two last, but the colour much darker, nearly as in *Sc. trilineatus* (vel *Delesserti*,) but inclining more to ashy than to fulvous, except on the head and flanks; lower parts ferruginous, paler on the breast, middle of the back nigrescent, with a strongly contrasting narrow bright fulvous streak in the middle, reaching from between the shoulders to near the tail; and an obscure stripe on either side barely reaching to the croup. Tail ferruginous along its centre, the hairs broadly margined with black, and finally with whitish; besides which there is another narrower black band on each hair, towards its base; chiefly seen as the tail is viewed from above; tip black, forming a pencil tuft 3 inches long. *Blyth.*

We have not as yet had an opportunity of seeing this species. Mr. E. Layard obtained it at Ambegammua (a highland district.) Mr. Blyth has described and called it after the discoverer.

SCIURUS KELAARTI. *Layard.*

May be described as very like *Sc. Palmarum* of India, but the head is much redder, the halves of the back and belly more blended; and the animal is altogether smaller. *Layard.*

Mr. Layard says, "that this squirrel replaces all the small *Sciuri* from Tangalle to Hambantotte, and I should fancy extends far on towards Trincomalie." We therefore sent Mr. Layard two specimens of the Trincomalie squirrel, which he identified with the one he calls after us. However honoured we feel, by the compliment paid, we cannot but admit that this squirrel like *S. brodiei* is very little removed from *S. tristriatus*, as described by Mr. Waterhouse. That both are merely varieties of *S. tristriatus* is further made probable, by observing in a series of Squirrels found at Trincomalie, nearly all the different shades of colour indicated by Waterhouse; and, among them are specimens, which could be identified even with *S. Brodiei.* The rufous cap is not present in all. With regard to the specimens we sent Mr. Blyth and Mr. Layard, the streaks on their backs were white throughout; but, in some other specimens subsequently obtained from the same locality, the posterior third of these streaks was of of a rusty-yellow colour, as is observed in some recognized varieties of *S. tristriatus.* The rump, however, in none of the Trincomalie specimens, was of so deep a rusty-colour as is observed in most specimens of *S. tristriatus* of Colombo and its neighbourhood; nor, is the vent so rusty, nor are the sides of the face at all rusty in any of the Trincomalie specimens. If *S. Kelaarti* is a distinct species, the latter negative characters may distinguish it, but not the rufous cap, which we have seen as deep in *S. tristriatus*; besides, it is not always present in squirrels of Colombo or Trincomalie.

With respect to the long tuft of the tail of *S. Brodiei,* we are not able to form an opinion, not having seen one with a long tuft. But, we may add, our conviction, that some of the specimens of Trincomalie squirrels have equally long tufts, and in them, the bony tips of the tails bore evident marks of having been broken off, at some former period of the animal's life; and nature appeared to have exerted its power in compensating for the diminution of the length of the tail, by elongating the terminal hairs of the broken off part into a long pencil tuft. That this may be the origin also of the pencil tuft in *S. brodiei* is very probable; for, according to Mr. Layard's own account, few of the specimens of *S. Brodiei* he saw, had the long tufts. Out of eight *S. Kelaarti* (apud Layard) two had the long tufts: and in both the long end of the tail had been broken off. However, it may have been otherwise with *S. brodiei,* which had long tufts to their tails, as seen by Mr. Layard.

SCIURUS TRILINEATUS. *Waterhouse.*

The Newera-Ellia "ground" Squirrel.

Syn: Sciurus Dellesserti—*Geurin.*
Sc: sublineatus.—*Waterhouse.*

Fur dense, soft; of a dark olive colour at the surface and minutely grizzled with tawny; base of hairs dusky black; under surface lighter coloured and more tawny. Some longer thin black hairs on the black and rump. Three indistinct pale lines, alternating with four dark ones on the back and croup. The tail grizzled, dusky olive brown and ferruginous; hairs annulated with two black and three tawny rings, the latter also terminal, the superior black one broadest.

Head and body............6½ inch.
Tail........................6 „

Geographical Distribution.—Neilgherries, (India,) Newera-Ellia, (Ceylon.)

This remarkable squirrel is common about Newera-Ellia and Dimboola; we have not seen it from lower parts than Pusilawa (3,000 feet.) This is the only quadruped, hitherto seen in Ceylon, which is identical with species in India restricted to the Neilgherry hills. Of birds we have several which are common to both the highland districts among them, *Hirundo domicola, Zosterops annulosus, Acanthyeis caudacata, Hypsipetes Neilgheris;* and many allied species such as the black bird, *Merula Kinnisi,* and *Palumbus Torringtonii,* nobis. A comparative account of the Fauna of the Neilgherries and Newera-Ellia would be very interesting. For this we are now collecting materials.

GENUS. PTEROMYS. *Cuv.*

This class of squirrels has its limbs invested in the skin of the sides, which is prolonged laterally, so as to form broad expansions, supported by the limbs and bony processes from each foot. These expansions are not naked as in the bats, but are covered above and beneath by short dense fur. They act like *parachutes,* in giving additional buoyancy to the animal in its leap from tree to tree. "The name of flying squirrel is a metaphorical expression of their most distinguishing peculiarity." There is also a peculiarity in the skulls of these squirrels which serves to distinguish them from the other genera of Sciuridæ. The posterior part of the nasal bones a little convex; the frontal bones strongly depressed in their middle and rising slightly afterwards; the posterior parts of the head do not begin sensibly to curve downwards before the middle of the parietal bones; cerebral cavity small, only half the length of the head. Tail not distichous.

Dental formula: Incisors $\frac{2}{2}$, canines $\frac{0\text{-}0}{0\text{-}0}$, molars $\frac{5\text{-}5}{4\text{-}4}=22$

PTEROMYS ORAL. *Tickel.*

The large flying Squirrel—Egala Dandoleyna—*Sing.*

Syn: Pteromys petaurista, male—*Pallas.*
P. Philippensis,—*Gray,* apud—*Elliot.*
Taguan—*Buffon.*

Head greyish brown, darker round the eyes and muzzle. Body above, rufous black or brown; grizzled more or less with white. Membranes lighter coloured. Limbs of a bright maronne. Under parts dusky grey; in some slightly fulvescent. Feet black. Tail long, rounded; black, or maronne brown, with whitish extreme points to the hairs on the terminal half.

An adult male measured;

	ft.	in.
Head and body	1.	9
Tail	1.	9½
Expanse	1.	6

Small intestines, 8 feet, 8 inch; large intestines, 6 feet, 6 inch; cœcum, 2 feet, 6 inch; stomach, 5 inches.

Geographical Distribution.—India, Philippine Isles? Ceylon.

This flying squirrel, varies so much in colour in different specimens, that at first sight, one is apt to suppose that the specimens are of more than one species. Mr. Blyth, has made his variety *cinerascens*, of *P. Oral*, in which the whitish tips of the fur are more predominating, thereby imparting a hoary grey appearance to the whole upper surface, and continued along the tail; the extreme tip only of which is blackish. This variety we have identified with *P. Oral* from Dimboola; in which, hoary splashes on the back and tail are very conspicuous. In another, obtained from Mr. Marcus, Surgeon, Kornegalle, there was scarcely any grey on the body; a dark maronne colour prevailed through the whole upper surface. Tail attenuated. Between these two varieties there are several intermediate, individual varieties.

GENUS. SCIUROPTERUS. *F. Cuv.*

In this genus, are included the flying Squirrels with distichous flat tails. They are further distinguished from *Pteromys*, by the anterior part of the profile of the head being straight to the middle of the frontal bones; where it takes a curved direction very much arched, without any intermediate depression. Occiput projecting; frontal bones elongated; and the capacity of the cranium comprising three fifths of the length of the head. The rest as in *Pteromys*. Several species have lately been added to the fauna of India. In Ceylon, to the present time, only one is known, which we call after after our industrious fellow labourer at Point Pedro.

SCIUROPTERUS LAYARDI *Nobis.*

Face grey, mixed with black; forehead rufous brown; a dusky spot on the nose; whiskers long and black; a tuft of long soft hairs below the ears, and a smaller tuft before them. The ear conch is ¾ inch long, posteriorly ovate and somewhat narrow. Fur dense, soft, moderately long, and very glossy on the surface. Upper surface of a rufous chestnut colour. Fur of the upper parts, of a dusky blackish colour for three fourths of its length; the tips coarser and coloured rufous chestnut. Beneath whitish grey. Under parts of neck and cheeks slightly ferruginous. Feet greyish, with a faint rufous tinge on the hind ones only. Membranes brown above and whitish beneath; the anterior part of the superior surface black, velvetty; with a soft dense, white fringe on the margin. Tail flat and broad, of a lighter chestnut above, washed with black; and under surface of a deeper black, except at tip. The only specimen we obtained measured;

	ft.	*in.*
Head and body	1.	4
Tail	0.	11½
Hind foot, from heel to tip of claws	0.	2½
Fore foot, to membrane	0.	1½

Geographical Distribution.—Ceylon.

Mr. Blyth, in noticing this species, remarks that it may possibly be a fine adult of *S. fuscocapillus* of Jerdon; but he is inclined to consider it distinct; and says, that it is nearly affined to *S. caniceps*, Gray, (from the Himalayas,) from which it differs, in having the fur of its under parts of a dull non-fulvescent white; the parachute membrane being margined with pure white fur, lengthened and conspicuous at the angle. Mr. Palliser (who shot this specimen at Dimboola) says, that this flying squirrel is rare on those heights, (4,500 feet); the *Pteromys oral* is often seen, of which he has also sent a fine specimen.

FAM: MURIDÆ.

GENUS. MUS. *Linn.*

Small quadrupeds, with long and scaly tail; short adpressed stiff hairs on the scaly whorls. Three molars to each jaw, the anterior of which is the largest, and the posterior the smallest. The grinders, when perfect, have a high and convex crown with ridges. The ridges on the upper ones are slightly three lobed, the central lobes larger. These tubercles or lobes are in adults worn down by attrition; they then present flat surfaces with transverse lines, which is the character of the molars generally found in specimens.

Dental formula: Incisors $\frac{2}{2}$, canines $\frac{0}{0}$, molars $\frac{3\text{-}3}{3\text{-}3}$, $=16$

MUS GIGANTEUS. *Hardw.*

The Bandicoot, or pig rat—Oora Meeyo—*Sing.*

Syn. Mus bandicota.—*Bechst.*
M. Malabaricus.—*Shaw.*
M. Perchal.—*Buffon.*
M. nemorivagus.—*Hodgson.*

Above, dark ashy brown, mixed with black. Beneath, lead coloured mixed with grey. On the back the short fur is mixed with long black bristly hairs. Limbs darker. Tail long, scaly, with short adpressed bristles. A large sized bandicoot measured,

Head and body	14	inches.
Tail	13	„

Small intestines, 6 feet; large intestines, 2 feet; cœcum, 4½ inches: stomach, 5¼ inches. Weight 2 lbs. 10 ounces. Rarely are larger specimens found.

Geographical Distribution.—Malayan peninsula, India, Ceylon.

The bandicoot is found in all parts of the Island. Bandicoots from Newera Ellia are particularly large, and of a darker colour, than those of the Maritime provinces. A specimen found in the neighbourhood of Kandy, had a rufous tinge on the posterior half of the back. It was kept alive for several days in a cage, till one night it got away by cutting up the wooden bars. It fed on rice, potatoes, and yams. These animals are very destructive to grain crops. At Newera Ellia, they are the farmers' pest; fields of potatoes and beds of peas are much injured by these rapacious creatures; the dove-cot and poultry yard are not exempted from their attacks. Some classes of malabars are very partial to the flesh of these rats, and they are much sought after by the coolies on coffee estates, who eat them roasted.

MUS RATTUS ? *Linn.*

The black rat—Kalloo Meeyo—*Sing.*

Above blackish brown, along the dorsal line nearly black; sides paler, some of the hairs with pale fulvous tips. Beneath and inside of limbs, fur very short, of a uniform sooty ash colour, separated from the colour above by a distinct line of demarcation. Whiskers black, long. Ears large, rounded, slightly villous externally. Tail black, scaly and covered with very short stiff hairs. Feet nearly naked. Female, 8 teats.

Head and body ....6½ inches.
Tail ....7½ „

Geographical Distribution.—Cosmopolitan.

This rat, from which the above description is taken, was killed in a house at Trincomalie. We have not seen the black rat, or any rat approaching the above characters, from any other part of the Island. Mr. Layard enumerates it in his list of Ceylon Mammals. No doubt, the black rat has been introduced by ships, which frequent the various ports of the Island.

MUS DECUMANUS. *Pallas*

The common brown house-rat—Gaval-Meeyo—*Sing.*

Syn. Mus Javanus.—apud *Schinz.*
Mus Norvegicus.—*Brisson.*

Fur above, greyish brown mixed with tawny; and longer slender black hairs. Beneath, greyish ash. Tail longer than the head and body, scaly; the whorls covered with very short adpressed bristles. A large brown rat found at Colombo measured,

Head and body ....10 inches.
Tail ....11 „

The generality of these rats are of smaller dimensions.

Geographical Distribution.—Cosmopolitan.

This rat, known in England as the Norway rat, (from its being supposed to have come over to Great Britain with the Norwegians), is ascertained to be of Asiatic origin, and to have been introduced into all parts of the world.

The black rat has nearly been worried out of England by the "stranger rat," *Mus decumanus*; and now, it is a rare thing to see a black rat in any part of Great Britain. It is still found in great abundance in France and other parts of the continent of Europe. Mr. Waterton, who wrote an account of the "History and habits of the brown or grey rat," says, that in all his life, he has seen but one single solitary specimen. We cannot help quoting, for the benefit of our Ceylon "*rat grubbers*" a piece of Mr. Waterton's sentimental soliloquy on seeing this unique representative of the old English black rat.

"Whilst I was looking at the little native prisoner in its cage, I could not help exclaiming, Poor injured Briton! hard indeed has been the fate of thy family! in another generation, at farthest, it will probably sink down to the dust for ever. Vain would be the attempt to trace the progress of the stranger rat through England's wide domains, as the old people, now alive, can tell nothing of its coming amongst them. No part of the country is free from its baneful presence; the fold and the field, the street and the stable, the ground and the garret, all bear undoubted testimony to its ubiquity and to its forbidding habits. After dining on the carrion in the filthiest sink, it will often manage to sup on the choicest dainties of the larder, where like CELŒNO of old, *vestigia fœda relinquit.* We may consider it saddled upon us for ever. Hercules himself, could he return to earth, would have his hands full, were he to attempt to drive this harpy back again to Stymphalus! It were loss of time to dwell on its peculiarities. Let any body trace its movements in the cellar, the dairy, the barn, and the outhouse, and he will be able to form some notion of the hungry mouths which we have to fill. Nine or ten young ones at a time, twice or thrice during the year, are an enormous increase, and must naturally recall to our minds one of the many plagues which formerly desolated the fertile lands of Egypt." The inhabitants of this fair Island, can speak as feelingly on the destructive propensities of the house rat, though not, perhaps, so eloquently. In time, they may also have to deplore the importation of the black rat.

Although our hunt, or grubbing, as some friends facetiously call our pursuit after rats in Ceylon, has not produced any such lamentations over the old Britain race, still we hope to describe faithfully the characters of all the species of *Muridæ* found in the Island; a labour not quite so unproductive or uninteresting as some may suppose, for our list contains 12 well identified species and 4 or 5 of doubtful characters. Perhaps next to bats, rats are the most difficult creatures to be properly identified, and in dried specimens it is next to an impossibility to define some species. Our descriptions are from fresh specimens, and when they do not correspond with the characters of a stuffed specimen, it is owing to the effects of drying and preparing. To return from this digression: we shall call the attention of observers, to a yellow reddish-brown variety of the common house rat found at Trincomalie and Batticaloa, which may probably be the *Mus decumanoides* of Hodgson:—this rat may be thus described;

Above, dark yellow brown, with long thin black hairs. Beneath dingy or yellowish ash, with a few long grey hairs. Shorter fur of the back, very similar to that of *Mus flavescens*, Elliot; but much darker and of slight rufous or reddish shade on the rump and posterior limbs. Base of hairs ash. Feet brown; soles purplish.

Head and body	7½ inch.
Tail	8½ „
Palma	5-10„
Planta	1. 1-10„
Head	1. 8-10„

This is the common house rat of Trincomalie, smaller than the *Mus decumanus*, of which we have seen only a few specimens in Trincomalie, where it is rare in houses in the town; but abundant in the dockyard. *Mus decumanus* is not very common in the hilly parts of the Island, other rats seem to replace it altogether on still higher parts. At Newera Ellia, where we resided for seven months, not one was observed. But it will not be long, ere the brown rat will find there also, a "habitation and a name."

MUS CEYLONUS. *nobis.*

Fur soft, lead colour; hair of upper parts tipped with dark fawn and black. Ears large, naked. Whiskers long, black. Tail longer than the head and body, scaly.

Head and body	4¾ inch
Tail	6 „

This small rat, is found in outhouses in the cinnamon gardens at Colombo. I have no reason to think it to be the young of the former species. The teeth were well developed. The darker colour and long tail, will easily distinguish the species from other Colombo rats.

MUS FLAVESCENS. *Elliot.*

The white bellied tree Rat—Ghas-Meeyo—*Sing.*

Syn: Mus rufescens—*Gray.*
M. rufus—*Elliot.*

Above, pale yellowish brown; under fur light lead colour. Beneath and inside of limbs, milky white. Fur above, composed of short lead coloured hairs, tipped yellow and black; intermixed with longer stiff, broad, grey bristly hairs, tipped black; many of the latter are channelled; bristles on the sides and shoulders are broader and stiffer in some specimens, and terminate in yellowish hair points. In addition to these, there are on the back, much longer, thin, black hairs, more or less numerous; a few of which on the posterior parts have grey tips. Head long, muzzle narrowed, whiskers long black. Ears large, subovate, slightly villous. Feet, brown on the medial line, sides and toes whitish, claws white and covered with grey hairs; soles purplish. Tail longer than the head and body.

Head and body	6¼ inches.
Tail	7 „

The molars in this species are more distinctly trilobed.

Geographical Distribution.—Malayan Peninsula, India, Ceylon. We have received specimens of this rat from Badulla, Kandy, Kaduganava, Kornegalle and Trincomalie; and we presume, it is found in many other parts of the Island. It lives on trees and in houses. Whenever a house is ceiled, it inhabits the ceiling in preference to the lower parts of the house: the common brown rat, on the contrary, rarely takes its abode on roofs of houses. There are several marked varieties of *Mus-flavescens* on the Island, which we have formerly regarded as distinct species.

VAR. RUFO-FLAVESCENS.

Syn: Mus. tetragonurus—*nobis.*

This is a reddish variety,—the prevailing hue of the head and back being of a reddish or cinnamon brown colour, with fewer black pointed bristles and hairs than in the last. Beneath, milky white. Basal third of the tail remarkably thick, and nearly tetragonal.

Dentition as in *Mus flavescens.*

Mr. Gill, the Medical Attendant of the Leper Hospital, procured us a specimen of this fine rat from Handelle, near Colombo, where it is rare.

VAR. KANDIANUS.

Syn: Mus Kandianus—*nobis.*

This rat, is the mountain variety of *Mus flavescens;* perhaps identical with *Mus fulvescens,* of Gray's catalogue of Mr. Hodgson's Nepal collection of animals in the British Museum.

The fur is longer, softer, and darker coloured. The under fur, too, of a deeper lead colour than in the two other varieties. Whiskers also much longer. Dentition nearly similar; the upper molars are broader and the lobes more distinct. Tail longer than the head and body. Soles dark purplish.

Head and body	6½ inch.
Tail	7½ „
Palma	5-12
Planta	1. 2-12

This is the common house rat of Newera-Ellia, Rambodde, and Pusilava; and it may probably be found a little lower. There is another rat in Newera-Ellia,) of which we do not now possess any specimens, of more slender make, of still longer and denser fur; of a dark olive brown surface colour on the upper parts. Beneath white, but not so defined as in *Mus flavescens.* The only specimen we had was sent to the Zoological Society of London. After seeing a description of *M. nitidus* of Hodgson, we suspect this is allied to it, if not identical.

MUS NEMORALIS. *Blyth.*

Syn: Mus arboreus?—*Apud nos.*

Very similar to *Mus flavescens,* or rather to our second variety of it. The colour of the abdomen is fulvous white, confined only to the tips of the hair; their bases being light lead colour. The stiff hairs on the back are more flattened and fusiform, and more deeply grooved. Size the same as *Mus flavescens.*

Geographical Distribution.—India, Ceylon.

The first specimens of this tree rat were procured at Colombo. We have since seen it at Trincomalie. They were caught in outhouses and gardens; a nest of one was seen on a mango tree. The only differences in the dentition of this species from that observed in *Mus flavescens* and its several varieties are, that the lobes are less distinct, and the ridges run rather obliquely; the former character may, however, be the effects of attrition.

At Trincomalie, this rat is found in gardens more frequently than *Mus flavescens,* from which it is easily distinguished, by the dingy or fulvous white of lower parts. We hope to see the Jaffna rats, before this account of Ceylon Mammals is published; and, perhaps, we shall be able from our own examination to add *Mus* (Nesokia) *Kok* to our list of Ceylon *Muridæ.*

MUS ASIATICUS? *Gray.*

Fur soft; above, pale brown mixed with black; sides, ashy grey. Beneath pure white, but not so defined as in the foregoing species. Tail rather thin, shorter than the head and body, Ears large, slightly villous. Limbs slender.

Head and body..............	6 inch.
Tail	$5\frac{1}{4}$

The specimen, from which the above description is given, was a full grown *enceinte* female.

Geographical Distribution.—India, Ceylon.

If our identification is correct, this rat may stand midway between *Mus decumanoides* and *Mus flavescens*, var *a*. This species is not numerous. We found a few in native huts at Colombo and Trincomalie. It cannot be confounded with *Mus nemoralis* from the pure white of the lower parts; from *Mus flavescens*, it may be distinguished by its smaller size, darker back, and proportionately shorter tail. It has not the dentition of *Nesokia*, of Gray.

MUS MANEI. *Gray.*

The common Indian mouse—Coosetta Meeyo—*Sing.*

Syn: Mus musculus—*Elliot*—and—*Kelaart.*

Fur short, dense; above, dark fawn brown, very glossy. Beneath, ash coloured, shaded with tawny. Hairs of the upper parts of a lead colour with tawny brown tips, mixed with some black hairs. Ears large, rounded, slightly villous. Tail greyish brown; a little longer than the head and body. Toes white.

Head and body	2. 6-10	inch.
Tail	3	„

Geographical Distribution.—India, Malayan Peninsula, Ceylon.

This house mouse, found in most parts of the Island, resembles the house mouse of Europe. Its longer tail, darker colour and white feet, are we believe the characters which made Mr. Gray separate this species from *Mus musculus* L. Another small mouse of a lighter colour, is found in houses at Trincomalie, which we consider distinct from this.

MUS CERVICOLOR? *Hodgson.*

Fur rather long, soft, glossy. Above, fulvous fawn brown. Beneath paler. Hairs dark lead colour, with yellowish tips. Tail rather shorter than the head and body, scaly and pubescent; of a dark brown above, paler on the lower surface. Feet dingy grey. Teeth pale. Whiskers long, black; a few shorter, grey.

Head and body	2. 9-10	inch.
Tail	2. 5-10	„
Head....................	9-10	„
Hind foot, with claws..........	6-10	„

The female from which the above measures were taken, had two young ones in utero. Teats ten, pectoral 3 pairs and 2 ventral.

This mouse is distinguished from *Mus Manei*, by its much lighter colour, longer hairs and shorter tail. We have seen it only in houses at Trincomalie.

GENUS. NESOKIA. *Gray.*

Cutting teeth very large, flat in front and smooth; grinders 3-3, front upper large with three cross ridges; the middle oblong, and the hinder much narrowed behind, each with two cross ridges; the front lower grinder larger, narrowed in front with three cross ridges; hinder each with two ridges, the hindermost smallest, rather narrowed behind; tail short, thick, with whorls of scales and scattered bristles; toes 4-5 moderate, the three middle subequal, long, the outer moderate; claws small, compressed; front thumb tubercular, with a rudimentary claw; ears moderate, naked. *Gray.*

This genus is easily known from the true Rats (*Mus,*) by the large size of the cutting teeth and the shortness of the tail; it appears to be intermediate between *Mus* and *Rhizomys.*

NESOKIA HARDWICKII. *Gray.*

The short tailed rat.

Syn: Mus Hardwickii—*Gray.*
Mus dubius—*Nobis.*

Fur rather soft; above, rufous brown. Hairs lead colour, tipped with rufous-yellow brown, and mixed on the back with longer and rather rigid blackish hairs. Sides paler. Beneath hoary, ash coloured; hairs, on the abdomen, short, lead or ash coloured with shining white or hoary tips. Whiskers few, thin, moderately long, some with grey points. Ears moderate, slightly villous. Tail shorter than the head and body; scaly, nearly naked.

Head and body	7½ inch.
Tail	5½ „
Head	1¾ „

Length of small intestines, 3 ft. 4 in.; large intestines, 11 in.; cœcum, 2 in.; stomach 3 in..

Geogaphical Distribution.—Southern India, Ceylon.

This rat is found in great abundance in grass lands near Kandy, and also in out houses and stable yards in the town of Kandy. Since we have compared the dentition of this rat, with Gray's description of the characters of the teeth of his genus *Nesokia,* we are quite sure

of its being a species of this genus, and we have very little doubt **of its identity with *Nesokia Hardwickii.***

NESOKIA KOK. *Gray.*

The Kok.

Syn: Mus Kok--*Gray.*

Neotoma providens—*Elliot.*
Arvicola Indica,—*Gray.*

Fur above, pale brown mixed with long black hairs. Under fur, lead coloured. Sides paler. Beneath whitish grey, extreme base of hairs slightly lead coloured. Most of the rigid brown or black tipped hairs on the back are flattened and slightly grooved. Whiskers moderately long, black; a few grey. Ears rounded, villous. Tail shorter than the body, scaly and partially covered with very short greyish hairs. Dentition as in the last species.

Head and body (about)...	8	inch.
Tail	5	„

Geographical Distribution. Southern India, Nepal, Ceylon.

The only specimen, from which the above description was taken, is a stuffed one, lately received from Mr. Edgar Layard. It is distinguished from *Nesokia Hardwickii*, by its larger size, more robust make and paler colour of the back; as also by the more uniform white colour of the abdomen and lower parts of the head and neck. The *Mus Kok* (*Neotoma Providens*) of Mr. Elliot's Catalogue would appear, from his description of the animal, to have a longer tail, and the abdomen to be less white than the specimen from Point Pedro. Rice cultivators of this district (North Eastern), inform us, that the *Kok* is also found here; and we are anxiously looking out for specimens. We cannot identify the *Kok* sent us by Mr. Layard, with the *Nesokia* from Kandy; and we trust our decision, that they are of distinct species, is correct, even if our identification is doubtful.

GENUS. GOLUNDA. *Gray.*

The grinders when perfect, low, with a broad flat crown; the cross ridges of the crown of the upper grinders divided into three distinct slightly raised tubercles. Upper incisors grooved. Rest like *Mus.*

GOLUNDA ELLIOTI. *Gray.*

The Coffee rat—Cofee-watte meeyo—*Sing.*

Syn: Mus hirsutus—*Elliot.*
Mus Coffæus—*nobis.*

Fur thick, stiff; above, fulvous brown, mixed with black. Beneath, tawny grey. Hairs of upper parts, flattened, ashy grey; tipped yellow with some thinner and longer ones, also tipped yellow, with subterminal black band. Under fur, soft, and of a light lead colour, Face and cheeks rough. Ears moderate, subovate, villous; yellow ferruginous. Tail round, tapering, scaly and villous; its upper surface, dark brown; lower surface, yellowish. Cutting teeth, yellow. Upper ones grooved as in Gerbillus.

Head and body	4½	inch.
Tail	4	„

Geographical Distribution.—Southern India, Ceylon.

This is the rat which is so destructive to coffee trees. Whole plantations, are sometimes deprived of buds and blossoms by these rats. They are found in all the higher parts of the Kandian provinces. The attention of Europeans, has only been drawn to them since coffee planting commenced in the Island. They appear to be migratory; and are not always seen in Coffee estates: when they do visit the cultivated parts, their numbers are so great, that in one day more than 1,000 have been known to be killed on one estate alone. In clearing forests, the nests of these rats are met with under the roots of trees. We have not been so fortunate as to see many fresh specimens; only one was brought to us from Kaduganava: a premium is set by some coffee planters on the heads of these rodents. The Malabar coolies are very fond of eating them roasted, or fried in oil.

We doubted for a long time, the identity of this *Golunda* with *Mus hirsutus* of Elliot, till Mr. Blyth compared it with specimens from Southern India, and pronounced it to be of the same species.

GOLUNDA NEWERA. *nobis.*

The Newera-Ellia soil rat.

Syn: Golunda meltada—*Gray.* } apud *Blyth.*
Mus lanuginosus—*Elliot.* }
Mus Newera—*nobis.*

Fur very soft: above, of a deep yellow—olive brown colour. Beneath yellowish grey, or tawny. Hairs of the upper parts, lead colour at the base, and golden at the extreme tips, mixed with longer silky black hairs, also tipped yellow. Hairs of the lower parts, of a lighter lead colour with tawny grey tips. Tail shorter than the body, tapering, scaly, and covered with very short stiff hairs; superior surface, dark brown; and inferior surface, light yellow. Feet tawny brown; soles blackish, nearly bald; claws purplish. Incisors yellow, upper ones grooved. Ears rounded, covered with short yellow hairs.

Head and body......................	3¼	inch.
Tail......................................	2¼	„

Geographical Distribution.—Southern India, ? Ceylon.

This rat is found in pairs in the black soil of Newera-Ellia. We have not seen it from any other part of the Island. The two specimens examined were both of the above dimensions and appeared to be adults. If Mr. Blyth is correct in identifying this *Golunda* with *Mus lanuginosus* of Elliot, he must have done so from his remembrance of the specimens from India; for the descriptions of Elliot and Gray do not quite correspond with the characters of our Newera Ellia *Golunda*. The adult of *Mus lanuginosus* is 5. 6-10 inch long in body, and the tail is 4. 3-10 in:. Total length 9. 9-10 inch:. Whereas, the total length of *G. Newera* is only 5½ inch. Nor does Mr. Gray mention any grooved upper incisors in *G. meltada*: (Annals of Nat: Histy: 1836.) Probably this may be only an omission on his part.

In the Ouva district, we found another soil rat, smaller than the above; of a pale ashy colour, which at the time we referred to *Leggada Booduga* of Gray, but having since lost the specimen preserved in spirits, we are not able to give a description of it. That it was very different, from every other rat here described, we have no doubt. Probably before the conclusion of our labours in Ceylon, we may succeed in procuring a specimen from Badulla, and likewise add other rats, which are common to Southern India, and which may be expected to exist also in this Island.

GENUS. GERBILLUS. *Desm: F. Cuv.*

Molars tuberculous, soon worn down to four transverse ridges. Upper incisors grooved. Eyes large and prominent. Ears large. Posterior extremities very long, with five toes. Fore feet as in rats. Tail long, without scales, covered with hair; the rest as in *Mus.*

GERBILLUS INDICUS. *Desm:*

The Indian Jerboa, or Kangaroo rat.

Syn: Dipus Indicus—*Hardwick.*

Fur above, light fulvous brown; sides, paler. Lower surface, white. Hairs above, light lead colour or ashy grey, with long fulvous or fulvous-brown tips; intermixed with thinner black hairs, which are more conspicuous on the pale coloured sides and cheeks. Ears large, nearly naked. Eye brows whitish. Nose elongated. Upper jaw fully half an inch beyond the lower. Whiskers, long, black, and a few grey. Tail longer than the body, blackish above and below; laterally, pale grey; tip terminates in a tuft of black hairs. Feet grey; soles flesh coloured.

Head and body	7	inch.
Tail	8½	„
Hind feet	1¼	„

Geographical Distribution.—India, Ceylon.

It would appear that the Ceylon *Jerboa*, is identical with the species found in Southern India. Mr. Gray gives two species of *Gerbils* from India. The Ceylon specimens are all alike, whether found in the highlands or in the maritime provinces. We had an opportunity of comparing live specimens found in Kandy, with a dozen live ones sent us by Mr. O'Holloran from the cinnamon gardens, Colombo; no difference was observed. There are individual varieties, some are paler, and others have fewer of the black hairs on the back and sides; but, in the formation of the head and dentition we have not observed any difference.

These jumping rats, are found in great abundance on open plains in the low country. The esplanades of Colpetty (Colombo) and Trincomalie are swarming with them; they dig deep holes and trenches under the ground to such an extent, that the esplanades are in some parts completely cut up by their subterranean abodes. They feed on grain, grass and roots. In confinement, they freely partake of nearly all kinds of grain and vegetables. They are doubtless carnivorous also, for one night several of them nearly devoured an albino of the common *Mus decumanus*, placed in the same cage with them.

FAM: HYSTRICIDÆ.

GENUS. HYSTRIX. *Cuv.*

Body, covered with stiff and pointed quills. Tail short. Four toes before, and five behind, furnished with stout claws. The skull very wide, swollen, convex above; the nasal and intermaxillaries very large, broad, oblong, as wide behind as before, and truncated behind; the palate wide between the grinders; the grinders oblong, longer than broad. The developement of the face is produced by the dilation of the hinder part of the intermaxillary bones. *Gray.*

Dental formula: Incisors $\frac{2}{2}$, canines $\frac{0}{0}$, molars $\frac{4\text{-}4}{4\text{-}4}$, $= 20$.

HYSTRIX LEUCURUS. *Sykes.*

The Indian crested Porcupine—Heetava—*Sing.*

Syn: Hystrix hirsutirostris.—*Brandt.*

H. cristata. *Linn*: apud—*Bennet.*

Blackish brown. Muzzle clothed with short, stiff, bristly hairs. Whiskers long, black; a few, tipped white. Spines of the throat short, grooved; some with white setaceous points forming a half collar, also a few white tipped spines on the face. Crest of head and neck full, long, formed of black bristles, a few with long white points. Spines of the sides, short, flat, grooved or striated; many of them terminating in white points. The larger thick quills on the back are either entirely black, or annulated at the base and middle with white; and a few terminate in white points. The longer and thinner quills on the back and sides, covering the thicker ones, have long white terminations; and many of these again (particularly the longest) have a basal and one or two central white rings. Short quills on the mesial line of the lumbar region, are nearly all white; and the longer striated quills of this region are mostly white. Quills of the tail white, or yellowish; a few black ones at the root. Pedunculated quills are long, broad; and much flattened in old animals.

A middle size male measured,

Head and body	32	inches.
Tail	8	„
Palma	2¼	„
Planta	3¾	„
Height at the shoulders	8½	„

Geographical Distribution.—India, Ceylon.

The crested Porcupine is found in nearly all parts of the Island: there is also a porcupine at Newera Ellia, which is said to be different from this; but we have not been so fortunate as to have procured a specimen of any porcupine from that mountain height. All the porcupines we have seen in Kandy, Colombo, and Trincomalie, are of one species, which we have referred to Sykes' *H. leucurus*. Mr. Blyth's young Ceylon porcupine, which he thought was the young of a new species is the young of the species which we take for *H. leucurus*, Sykes. Mr. Blyth has since informed us, that his opinion has changed regarding the young porcupine Mr. Layard sent him, of which he has made his new species *H. Zeylonensis*. We have to hear further from him if he agrees to our identification of the Ceylon Porcupine with *H. leucurus*. All the young ones of this species we have examined, correspond with Mr. Blyth's description of *H. Zeylonensis*. The characters of the quills alter as the animal grows, and in adults, the white annulations are very different. Part of the crest bristles of males only have white points. In females, fewer have white terminations. The latter character agrees with the distinction drawn by Mr. Waterhouse, between the crest bristles of *H. Cristata* and *H. hirsutirostris* (vel *H. leucurus*). Mr. Waterhouse, in his excellent account of porcupines, draws the following principal distinctions between the Indian and European porcupine. "The quills in the lumbar region" says Mr. Waterhouse "are entirely white in *H. leucurus* and chiefly dusky in *H. Cristata*, and the bristles in the crest of the latter have all long white points; whereas, in *H. leucurus*, only *some* have white points the rest are entirely brown. The long quills on the back have the white more extended in *H. leucurus*."

The identification of species from single characters, is at all times difficult and unsatisfactory. In the genus Hystrix particularly so, as regards the conformation of the skull. Mr. Gray, in his interesting memoir on *Hystricidæ*, observes, "that though the skulls of *H. leucurus* preserve a very distinct character, yet they vary so much among themselves as to show, that skulls afford no better character, for the distinction of species than any other single character, such as colour, but can only be depended on, when taken in connexion with the rest of the organization."

The number of molars, varies also in different specimens. In two adults, obtained at Trincomalie, there were only three molars on each side of the jaw;—four being the number of the dental formula of genus *Hystrix*.

Mr. Blyth, has lately described other species of Indian porcupines; and Ceylon may yield more than the one species we have described.

In the Army Medical Officers' Museum at Colombo, is a stuffed specimen of porcupine, marked *H. Cristata*. which is similar to our specimens identified with Sykes' *H. leucurus*.

FAM: LEPORIDÆ.

GENUS. LEPUS. *Cuv.*

Hares are distinguished by their long ears, short tail, imperfect clavicles, and antorbital space in the cranium widely pierced and reticulated. Fore legs short, with five toes; the hind feet long, with only four toes, covered with hair. Teats from six to ten. Cœcum very large.

Centre upper incisors large, wedge-shaped, with a longitudinal furrow in front; lower incisors square; molars crowned with transverse laminæ of enamel.

Dental formula: Incisors $\frac{4}{2}$, canines $\frac{0}{0}$, molars $\frac{6\text{-}6}{5\text{-}5}$, = 28.

LEPUS NIGRICOLLIS. *F. Cuv.*

The black necked Indian Hare—Hava—*Sing*..

Syn. Lepus Kurgosa.—*Buchanan.*
L. melanauchen.—*Temm.*

Upper parts, rufescent yellow, mottled with black; single hairs, annulated yellow and black. Chin, abdomen, and inside of hind limbs, downy, white; a black velvetty spot on the occiput and upper part of neck extending to near the shoulders. The spot under the neck, is in some specimens of a bright yellow colour. Ears long, greyish brown internally, with white fringes at the apical part; dusky posteriorly; black at the base. Feet yellowish. Tail above, grizzled with black and yellow; beneath white.

Head and body	19	inch.
Tail	2½	„
Ears	4¾	„

Geogrphical Distribution.—Southern India, * Ceylon, South America? This is the common hare of the Island, and probably the only species in it. The Newera Ellia hare, is larger than the low country animal. Rabbits (*Lepus cuniculus.* L) and guinea pigs (*Cavia cobaya*) have been introduced, and are domesticated in various parts of the Island.

An animal called a "small hare," was described to us by a gentleman in Newera Ellia, which makes us think that a *Lagomys* also exists in the Island. This hare pursued by dogs took refuge in the hollow of a felled trunk of a tree, which it was made to quit only by smoking the hollow; the animal was eventually devoured by dogs. This notice will, we trust, attract the attention of some sportsmen in the alpine parts of the Island, who may probably be able to add another quadruped *new* to the Fauna of Ceylon.

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* The hare of Bengal and all upper India is *Lepus ruficaudatus.* I. Geoff.

ORDER. EDENTATA.

GENUS. MANIS. *Linn.*

Body and tail, entirely covered above with large triangular trenchant scales, disposed quincuncially, and overlapping each other like tiles. Lower jaw small. Tongue long and extensile. Toes five, armed with robust claws. Body endowed with the faculty of rolling itself up more or less like a ball. No teeth.

MANIS CRASSICAUDATA. *Geoff.*

The Pangolin, or Scaly Ant Eater—Caballaya—*Sing.*

Syn. Manis pentadactyla.—*Linn.*
M. brachyura.—*Erxl.*
M. aurita.—*Hodgson.*
Pangolin.—*Buffon,*

Head small, conical and pointed; muzzle narrow and elongated Body stout, rounded above, and flattened beneath. Tail rather shorter. than the head and body; thick, broad at the base and terminating in a narrow point; its superior surface, convex; inferior, nearly flat or slightly arched. Upper parts of the head, neck, body and tail covered with imbricate triangular scales, of a pale yellow brown colour. Limbs also covered externally with scales. Scales on the head and limbs, small; those of the back and tail large. On the back, from 10 to 11 longitudinal series of scales; from 16 to 17 marginal scales to the tail. On the medial line, the number of scales in a very large specimen, was 16 on the body and 17 on the tail. From 4 to 5, diagonally across the lower surface of the basal third of tail. Lower surface of the neck and body, and inner parts of limbs naked.—of a flehy white colour. A few grey hairs project from under the scales of some specimens; in the very young animal, these hairs are nearly always present. Ears small, naked. Legs short, stout. Three middle claws of the fore feet elongated,—the centre one, nearly an inch beyond the others.

Claws of the hind toes, short; directed downwards. Soles bald, coriaceous and tuberculated.

The largest specimen examined, measured,

Head and body..............23½ inch.
Tail ....22½ „

Total length, 3 feet, 10 inches.
Weight....................42lbs.

Small intestines, 13 feet 10 in.; large intestines, 1 foot, 1 in.; no cœcum. Inferior arch of the stomach, 9 in., superior arch 4½ in; on the inner surface of the great curvature of the stomach, there was (in the only specimen whose internal organs we have examined) a peculiarly shaped glandular body, very like, if not similar, to the glandular body found by Dr. Cantor in the stomach of *Manis Javanica*; the external appearance of which he compares to that of a crest of ostrich feathers. Pylorus, thickened and gizzard like. Spleen 5¾ in. long, and 1¼ in. broad in the central part. Kidneys 2½ in. long. Liver 3 lobed; gall bladder 1½ in. long.

Geographical distribution,—India, Ceylon.

Not having with us the volume of the J. A. S. B. containing Capt. Tickell's elaborate account of the anatomical characters of *Manis crassicaudata* of India, we are unable to form a comparison between his description and the above, made from a careful dissection of a Manis, which lived for several weeks in our compound at Trincomalie. The only doubt we have of our identification of this animal with the Indian *Manis crassicaudata*, is the presence of the glandular body in the stomach. It was absent in specimens dissected by Mr. Blyth; and we cannot remember whether Tickell describes it or not.

The only species we have seen in the Island, is the one above described; though, from Mr Layard's list, one might might infer there are more than one species. The large specimen, from which the above description was taken, had its tail rather longer than we have seen it before in other specimens; but the number of scales and other characters corresponded with specimens examined previously.

The *Manis* or *Pangolin*, is vulgarly called in Ceylon *Armadillo*, or "*Negombo devil.*" The former name was interpreted into *Dasypus*, and we actually saw a stuffed specimen ticketed *Dasypus Sexcinctus*, an animal peculiar to South America; and which could not by any possibility be taken for a species of the genus *Manis*, by any one who has the slightest scientific knowledge of the *Règne animal.*

The *Manis* can with care be kept alive for some months in a garden, where its principal food will be ants, which it licks up with the tongue. At first it is very timid, the slightest touch or noise will make it roll up into a ball; but after a time, it becomes indifferent even to the presence of man. The one last examined, used to come into the house at night in search of ants, which abound in all houses in Trincomalie. It was quite terrestrial and nocturnal in its habits. During the day it slept rolled up in a ball under some shady corner. Nothing but the force of two or three men could make the Pangolin unroll itself, when once it took the form of a ball, with the head between the fore-legs and the tail round the whole.

Kandy is the highest part of the Island from whence we obtained specimens; they are seen in the neighbourhood of Colombo, Trincomalie, Kurnegalle, and no doubt in many other parts of the Island.

ORDER. PACHYDERMATA.

P. Proboscoidea.

GENUS. ELEPHAS. *Linn.*

Animals with the nose elongated into a cylindrical proboscis, moveable in all directions, with a moveable appendix at the termination, serving the purpose of a finger. Head very large; neck short, eyes small, lateral. Ears extremely flat, and very large and massive. Tail short, tufted at the end. Two mammæ. Five toes.

Dental formula: Incisors $\frac{2}{0}$, canines $\frac{0}{0}$, molars $\frac{2\text{-}2}{2\text{-}2} = 10$.

Incisors in form of elongated tusks, slightly arched towards their extremity; composed of ivory, cased in a crust of enamel; molars composed of vertical and transverse laminæ covered by enamel.

ELEPHAS INDICUS. *Linn.*

The Asiatic Elephant—Alliah—*Sing.*

Syn. Elephas Asiaticus—*Blumenb.*
E. maximus—*Linn. S. N.*

This well known lord of the forest, and the largest of living quadrupeds, is found in great abundance all over Southern Asia and Ceylon.

The generic characters are sufficient to distinguish the elephant from all other animals in Ceylon. The only other species is the African elephant (Elephas Africanus, *Cuv.*) from which the Asiatic elephant is distinguished by its oblong head, rather convex forehead, smaller ears, and above all by the different arrangement of the enamel in the molars. In the Asiatic elephant, the enamel is disposed in transverse undulating lines; in the African, the molars are marked by lozenge shaped lines of enamel.

Geographical Distribution.—India, Malayan Peninsula, Burma, Siam, Borneo, Sumatra, Ceylon.

The largest Ceylon elephant we have seen was nearly 12 feet high at the shoulder. Some of the elephants attached to the Budhist temple at Kandy, may be ranked among the finest in the world. They are of a uniform blackish colour, with very long tusks. A white elephant has not been seen in the Island within the memory of the present generation, but partially albescent elephants are not uncommon; generally, the ears and neck are spotted white.

"Elephant shooting" is still a great sport of Europeans. Catching them alive in Kraals is not now so often practised, as in former years.

The elephant is found in most parts of the Island, where there is a dense jungle. They are very abundant in Newera Ellia: their existence in that cold alpine region, has made Dr. Davy observe, that fossil remains of Elephants in Europe do not necessarily show that Europe was warmer, when elephants formed a part of its Fauna.

P. Ordinaria.

GENUS. SUS. *Linn.*

Body covered with bristles. Four toes to each foot, the two middle ones only touching the ground, armed with strong hoofs. Nose elongated, cartilaginous. Twelve teats.

Dental formula: Incisors $\frac{4}{6}$, or $\frac{6}{6}$, canines $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{7\text{-}7}{7\text{-}7}$, = 42 or 44.

Canines bent upwards and laterally, molars tuberculous; lower incisors bent forward.

SUS INDICUS. *Gray.*

The Indian wild Boar—Waloora—*Sing.*

Syn. Sus Scrofa—Var—*Hodgson* and *Elliot.*

The following description was taken from a large boar killed at Newera-Ellia.

Ears scantily covered with black hairs in the upper half of the external surface; internally black, hairy; a few black and white hairs in the lateral parts of the head, below the ears. On the face and head black bristles. On the occiput and neck, rather longer bristly hairs, forming a short mane or semi-erect crest. Inside of limbs, nakedish; externally, covered with black bristly hairs. Bristles on back and sides black, those of the throat and chest reversed (or growing forwards); tips white; a few long bristly hairs on the anterior part of pubis, and a few white hairs posterior to it. Tail short, slightly hairy; tip arrow-shaped.

Head and body, 4 ft:, 10 in: long. Tail, 10 inches.

Geographical Distribution.—India, Malayan Peninsula, Ceylon.

We have not been able to procure a whole wild boar from the Maritime provinces, since we undertook writing this work; and therefore, we have given above, the description of a Newera Ellia wild boar; which, to the best of our recollection, differs in external characters little from the boar of the low country. When stationed at Newera Ellia, we had not then contemplated writing an account of all the Ceylon Mammals; or, we should have paid more attention to the cranial formation of this animal; but it struck us at the time we saw in our neighbour Captain Montenach's possession several skulls of wild boars, that the head was flatter and narrower in the forehead, and the vertex more contracted, than in the skull of the low country boar.

The following are the measurements of two skulls procured at Trincomalie.

	No. 1 *Inch.*	No. 2 *Inch.*
Total length of head from vertex to tip of nasal bones	15	15¾
Breadth of vertex at narrowest part	1½	1⅞
Do. of narrowest part of palate	1. 1-10	1. 3-10
Length of last upper molar	1. 4-10	1. 8-10
Breadth of do. anteriorly	¾	1

No. 2, is the skull of a full grown male; the sex of No. 1 we could not ascertain. In another skull of a smaller animal also found near Trincomalie, the skull measured in length only 1 foot; the narrowest part of the vertex 1. 3-10 in. broad; and the palate at the narrowest part, between the last molars, 9-10 in:; and the last molar only 9-10 in. long, and 7-10 in: broad. We hope to be able to give in the Appendix the craniological character of the wild Boar of Newera Ellia, as we are promised a collection of skulls by Mr. Palliser.*

Mr. Blyth, makes a distinct species (*Sus Zeylonensis*), from a single specimen of a boar's skull received from Mr. Edgar Layard. That skull, Mr. Blyth remarks, approximates closely in contour to the figures of the skull of *Sus barbatus* by Dr. S. Muller and M. Temminck. Mr. Blyth gives the following description of the skull from Ceylon, which he believes to differ from the skull of the wild boars of India.

***Sus Zeylonensis*:** Blyth. Skull longer than that of the Indian Boar, nearly straight in profile; very much contracted at the vertex. Palate contracting posteriorly to less than 1 in:, from the magnitude of the last molar; which is considerably larger in both jaws than in the wild Boar of India, the upper measuring 1¾ in: long, by 15-16 in: broad, anteriorly. Vertex narrowing to 1 in: in breath. Total length of the skull, from vertex to tips of nasals. 16¼ in:; (*Blyth. J. A. B. Vol:* 2. 1851.)

Taking into consideration merely the difference in the proportionate breadth of this skull and of the two others given by us, we are inclined to think, that Mr. Blyth will not claim our two skulls as belonging to his new species *Sus Zeylonensis.* This we shall know, as No. 1 is now *en route* to Calcutta, and the other will follow. In the meantime it strikes us forcibly that skulls when taken singly, may not afford good characters to distinguish species. It is a question, whether skulls of boars do not vary among themselves as much as the skulls of porcupines.

What Mr. Walter Elliot points out, as the difference between the Indian and German wild boar, is equally applicable to the Newera Ellia boar, viz., that "it differs considerably from the German. The "head of the former is larger and more pointed, and the plane of "the forehead straight, while it is concave in the European. The "ears of the former, are small and pointed; in the latter, larger and "not so erect. The Indian is altogether a more active looking animal; "the German has a stronger, heavier appearance." The same differences says Mr. Elliot, are perceptible in the domesticated individuals of the two countries.

The young wild boar is more hairy, of a tawny or fulvous brown, marked with longitudinal lighter fulvous stripes on the sides. The young of a cross breed between the wild species and the domesticated Hog, has also the fulvous streaks. Such breeds are frequently met with in native villages.

ORDER. RUMINANTIA.

FAM: MOSCHIDÆ.

GENUS. MOSCHUS. *Linn.*

Ruminants without horns; false hoofs; upper canine teeth, long, not excerted.

Mr. Gray remarks, that the latter is not a good generic character, as most of the Indian species of deer have canine teeth; but that the *hairiness* or *nakedness* of the metatarsus, and the *presence* or *absence* of the musk bag, are better characters for generic distinctions.

Dental formula: Incisors $\frac{0}{8}$, canines $\frac{1\text{-}1}{0\text{-}0}$, molars $\frac{6\text{-}6}{6\text{-}6}$, = 34.

SUBGENUS. MEMINNA. *Gray.*

Hinder edge of the metatarsus, covered with hair; no musk bag in either sex; false hoofs; no lachrymal sinus. No canines in female.

MEMININA INDICA. *Gray.*

The Meminna—Walmooha—*Sing.*

Syn: Moschus Meminna.—*Erxl.*

Indian Musk.—*Pennant.*

Above, olive brown mixed with yellowish grey. Beneath white; one or two prolongations of the brown from the upper parts on the lower part of the neck. Ears short, pubescent, externally of a reddish brown. Sides and haunches, spotted in such a manner as to form longitudinal interrupted lines; the two superior ones of these spotted streaks, are united by transverse bands on the croup, to the two corresponding streaks on the opposite side. Tail very short. The largest one examined was 23 inches in length; of which, the tail was 1½ in:. Height at the shoulder, 10 inches.

Geographical Distribution. India, Ceylon.

The Meminna is better known in Ceylon, by the name of the "Moose deer." It is very common throughout the Island. Newera Ellia specimens are of a darker olive brown colour.

The flesh of this deer is not very palatable; the *Muntjac* is of a more delicious flavour The *Rusa* and *Axis* are not much esteemed by Europeans: it is only in the mountains that the former can be rendered tender enough for the European palate.

FAM: CERVIDÆ.

GENUS. CERVUS. *Linn.*

Head long, terminating by a muzzle; eyes large, pupils elongated transversely; lachrymal sinus in most. Ears large and pointed. Tongue soft. Body slender; four inguinal mammæ. Horns solid, deciduous, palmated, branched, or simple in the male; females, with one exception, without horns. Canines, when they exist, compressed and bent back. Dental formula: Incisors $\frac{0}{8}$, canines $\frac{0}{0}$, or $\frac{1\text{-}1}{0\text{-}0}$, molars $\frac{6\text{-}6}{6\text{-}6}$, =32 or 34.

SUBGENUS. AXIS. *H. Smith.*

Horns sessile, branched, with a solitary basilary antler, without median antlers; and the upper antler, ordinarily simple. Horns in males only. Canines in both sexes.

AXIS MACULATA. *H. Smith.*

The Spotted deer.—Tic Mooha—*Sing.*

Syn: Cervus axis—*Erxl.*
C. nudipalpebra—*Ogilby.*
Axis major et minor—*Hodgson.*

Head brown; blackish on the nose, forehead and vertex. Ears long, brown outside, and whitish on the inner surface. Body yellow-fawn brown with a blackish dorsal streak extending from the nape to the tail. Beneath and inside of limbs, white. Back, sides and upper parts of limbs, spotted white. In some, there is a narrow white streak (formed by the union of white spots), just above the separation of the brown colour from the white of the abdomen. Tail rather long, white beneath. Horns slender, bifurcated with one basal and one subterminal snag.

Geographical Distribution. India, Ceylon, Malayan Peninsula.

The spotted *Axis*, is very like the fallow deer in size and general appearance. The *Axis*, however, does not change its spotted coat like the fallow deer; nor does it even when domesticated in England.

This deer is found all over the Island, except on the very highest parts. Albinos of this species are not unfrequently seen. The spotted deer is a favorite object with sportsmen, both European and Native. They are generally seen in open pastures after sunset; the thick jungle is their resort during the heat of the day. Female gestates for 6 months. Their habits are gregarious; generally observed in parties of six or eight.

AXIS ORYZUS. *nobis.*

Paddy field deer—Weel-mooha. *Sing.*

Light fawn brown, with two parallel lines of small white spots on the medial line of the back; white hairs interpersed on the sides and upper parts of limbs. Beneath whitish. Tail short, fawn brown above, and white beneath. Horns small, trifurcated?

Geographical Distribution, Ceylon.

About two thirds the size of the *Axis maculata.* It is a more active animal; found generally in paddy fields, or other cultivated grounds in the Southern parts of the Island. It is allied to the Porcine deer of India.

The true "Porcine deer" is said to exist in Ceylon; but, we have not seen one. Whether the small deer of Saffragam, is different from the species here described, remains to be ascertained.

SUB-GENUS. RUSA. *H. Smith.*

The *Rusa* differs from the *Axis* in the horns being thicker and more pearly. Both sexes have canines. Heavily maned. Horns in males only.

RUSA HIPPELAPHUS. *Cuv.*

The Ceylon "Elk"—Gona Rusa—*Sing.*

Syn: Cervus unicolor—*H. Smith.*
C. equinus—*Cuv.*
C. Rusa—*Raffles.*
C. Aristotelis (?)
Great axis—*Auct.*

Dark brown; hairs rougher and stiffer than in the spotted *Axis*

Females lighter coloured. Head, of a darker brown colour than the rest of the body; particularly, the margin of the lips, the facial ridge and fore-head, Neck and sides of face, covered with long bristly hairs, of an ashy brown colour. Chin whitish, and posteriorly a little tawny. Round the eye and lachrymal sinus, a continuous pale margin. The hairs of the upper parts of the face and head have a subterminal yellowish or grey band, which is more conspicuous in young animals; in whom also the subterminal band is found on hairs of other parts of the body. Ears, long and broad; of a dark brown externally, lighter coloured internally; with long bristly white hairs on the inferior edges. Inner side of thighs, scantily covered with white hairs. On the posterior part of the belly and round the genitals, the hairs are also white. Round the vent and edges of thighs the hairs are in some specimens, of a bright tan colour. Tail short, dark brown above and terminating in a black tuft; lower surface, white and margins tawny. Horns long, rather thick and pearly. Basal antler on the burr; directed outwards and then inwards. The long antler is directed upwards, outwards and then a little inwards at the apex. The third or terminal snag is directed backwards, inwards and upwards. No two horns are alike in size or even direction and length of the antlers. The greatest distance between a pair of horns observed was, 2 feet, 2 inches at the terminal third. Females gestate 8 months and bring forth one young at a time.

A full grown male killed at Newera Ellia measured,

Head and body	4.	feet	10	inch.
Tail	1.	„	1	„
Ears (length).........	0.	„	7½	„
Head from apex of muzzle to occipital protuberance.... ...	1.	„	4	„
Muzzle to ant: angle of the eye ...	0	„	8½	„
Posterior angle of eye to base of ear	0	„	4¾	„
Diameter of head, between the ears.	0	„	7¼	„
Circumferance of neck (with hairs) ...	2.	„	5	„
Do. of body at its greatest breadth	5.	„	8	„
Height, at shoulder	4.	„	2	„
Do. at haunch.......................	4.	„	4	„

This is about the largest sized animal. The intestines of the same measured as follows,

Small Intestines	88	feet.
Large do.	38	„
Cœcum	1¼	„

The termination of the small intestines into the cœcum, considerably widened, for about 4 feet of its length. Liver moderate sized. No gall bladder. Kidney 6 inches, long, and 3 in: broad.

Geographical Distribution. India, Malayan Peninsula, Ceylon.

This species was long considered distinct from the Indian Rusa; it has since been ascertained that it is only a variety of the great Indian *Sammer deer*; the absence of the whitish disk on the rump, probably, made *H. Smith* call it "*Cervus Unicolor*; by which name it was so long known.

The Gona Rusa, the Elk of Europeans in Ceylon, gives some sport to those who keep a good pack of hounds. When fast pressed upon by dogs, it generally takes to water, where the huntsman's knife soon despatches it; but the hunt is after all a very tame affair. A lady from Bengal who had seen sports in India compared the "Newera Ellia Elk hunt" to hunting a cow. The animal seldom stands at bay, but when it does, its bristly mane gives it a formidable appearance.

The Rusa is very common in most parts of the Island. It is found in great abundance on the Horton, Newera Ellia and Boopatalawa plains. We visited once the hunting quarters of Capt. Montenach of H. M. 15th Regt: (the Gordon Cumming of Ceylon) on Horton plain; scarcely a morning passed without finding two or three Elks. The venison was excellent, and the hospitality of our friends fully compensated for the disagreeable journey from Newera Ellia on a cold and stormy day, and knee deep in mud and water.

SUB-GENUS. STYLOCERUS. *H. Smith.*

Horns in male only, small, with one basal snag, supported on long osseous pedicles covered with hair, rising from the os frontis, and continuous with long projections or ribs on the face. Males have large canines in the upper jaw, trenchant and exerted as in the Musks.

STYLOCERUS MUNTJACUS. *H. Smith.*

The Muntjac—Welly or Hoola Mooha—*Sing.*

Syn: Muntjacus vaginalis,—*Gray.*
Cervus vaginalis—*Boddaert.*
C. Muntjac—*Schreb.*
C. moschus.—*Desmarest.*

Above reddish brown. Beneath and inside of thighs white. Head pointed. Two black folds of skin, corresponding with the ribs on the face. Tail short and flattened. Horns very short, bifurcated. Females no horns, with bristly black tufts instead.

About 3½ ft. long, and 2 ft. 4 inches high at the shoulder.

The small intestines of a male, killed at Newera Ellia, measured 19 ft. 8 inch.; large intestines 12 ft.; cœcum 1 ft.

Geographical Distribution.—India, Malayan Peninsula, Ceylon.

This is the red hog deer of Ceylon Sportsmen, found nearly on all parts of the Island; very common about Newera Ellia and Horton plains. The low country animal is not so red as the mountain variety.

FAM: BOVIDÆ.

GENUS. BOS. *Linn.*

Cranium moderate, proportional, or without excess in the cerebral or facial regions; frontals shorter than the face, flat and not broader than long. Occipital plane of the skull quadrangular, never arched along the culminal line, nor indented by the terminal fossæ, smaller much than the frontal plane and forming an acute angle therewith. Horns attached to the highest line of the fore-head, rounded, moderate, curved up or down or forward; 13 pairs of ribs. No true dorsal ridge, but sometimes a fleshy lump; dewlap and muzzle large and square. *Hodgson.*

Dental formula: Incisors $\frac{0}{8}$, canines $\frac{0}{0}$, molars $\frac{6\text{-}6}{6\text{-}6}$, $=32$.

BOS TAURUS. VAR. INDICUS. *Linn.*

The Indian Ox—Harakah—*Sing.*

Syn. Bos domesticus.—*Linn.*

Several varieties of the Indian ox are seen in the Island, but all have evidently been introduced. What is commonly known as the "*Tavelan bullock*" is better adapted, from its more compact make to travel on mountainous paths, with a load on its back, than the coast bullock, which is more serviceable in carts. The high cast brahmin bull, is very rare in Ceylon. Although there are in many parts of the Island good pasture lands, no attempt to improve the breed of cattle, on an extensive scale, has been made. The markets are generally supplied with inferior beef; even at Newera Ellia, where one naturally expects better beef than at Colombo, we were very much disappointed at finding the toughest beef in the Island. The inferior quality of the Newera Ellia grass prevents improvement in the cattle, but as there is abundance of good grass in Dimboola, some endeavour will doubtless soon be made in that direction, for the improvement of so generally useful an animal as the ox.

GENUS. BUBALUS. *H. Smith.*

Cranium large, elongated, compressed or narrow, disproportional, exhibiting great excess (a 3rd) in the facial over the frontal or cerebral portion; frontals short, narrow, convex, usually forming an obtuse angle with the occipital plane, which is large and circular in proportion to the obtuseness of that angle, and to the consequent rounding off of the culminal line of separation, parietals merged, not ridged as in the last, nor culminal. Horns attached to the ends of the highest line of the skull, always exceeding in length that of the cranium, and usually greatly so depressed, strictly trigonal, and neither ascending nor descending, but directed horizontally backwards. Thirteen pairs of ribs. No true dorsal ridge, nor fleshy haunch. Muzzle large and square; dewlap medial. *Hodgson.*

Dental formula: Incisors $\frac{0}{8}$, canines $\frac{0}{0}$, molars $\frac{6\text{-}6}{6\text{-}6}$, $=32$.

BUBALUS BUFFELUS. *Gray.*

The buffalo—Mee Harak.—*Sing.*

Syn. Bubalus ferus Indicus.—*Hodgson.*
Bos arnee.—*Shaw.*
Bos bubalus.—*Brisson.*

The wild buffalo is of a darker colour, and more hairy than the domesticated variety. The former is sometimes seen of a black colour.

Geographical Distribution.—India, Southern China, Malayan Peninsula, Ceylon,

The wild buffalo is very common in the Northern and Eastern Provinces, rare in the mountainous parts of the Island. The *Bos Gaurus*, so abundant in the Indian Peninsula, from Cape Comorin to the Himalayas, was doubtless also found in former years in Ceylon. The description Knox gives of the *Goura* in Ceylon can only apply to this species of Ruminants. The Kandians also say, that the *Goura* once roamed through those forests, which to the present day are called after the Goura,—Goura-Ellia, Goura-Koodie, &c. That the *Goura* has become extinct in Ceylon, is all but probable: however, we do not despair of hearing of the *Goura* being yet found in the unexplored forest tracts of the Island. It is even quite possible, that such an animal may have been killed by Ceylon sportsmen, and left to decay in the woods, as a specimen of the wild buffalo. Mr. Walter Elliot, writing of the *Bos Gaurus* in 1840, says. that "it is somewhat remarkable that one of the largest animals of the Indian Fauna, should only have been indicated distinctly within the last two years." And therefore we may expect that *Bos Gaurus* will one day be added to the living Fauna of Ceylon. See appendix for a description of the Indian *Bos Gaurus* by Mr. Walter Elliot.

ORDER. CETACEA.

a. Herbivora.

GENUS. HALICORE. *Illiger.*

Body housepisciform, terminated by a horizontal fin with two lobes; head not distinct from the body; muzzle truncated and moveable, with thick spiny hairs on the edges of the lips; tongue soft; fins short, without distinct fingers or nails; seven cervical vertebræ. Eighteen pairs of ribs. Cœcum undivided. Pelvis bones distinct.

Dental formula in adults: Incisors $\frac{2}{0}$, canines $\frac{0}{0}$, molars $\frac{3\text{-}3}{3\text{-}3}$, $=14$.

Do.——— early age: Incisors $\frac{4}{8}$, do. $\frac{0}{0}$. do. $\frac{5\text{-}5}{5\text{-}5}$, $=32$.

Two of the upper incisors cylindrical and straight, forming tusks; molars cylindrical.

HALICORE INDICUS. *Desm.*

The Dugong, or Sea Hog—Mooda Oora—*Sing.*

Syn. Trichechus Dugong—*Erxl.*
Halicore Cetacea—*Illiger.*
Halicore Dugong—*Cuvier.*
Halicore tabernacularum—*Ruppell.*
Dugongus marinus—*Tiedem.*
Dugong—*Buffon.*

Colour bluish grey. From 5 to 7 feet long.

Geographical Distribution.—The Indian Ocean.

We have not seen a fresh specimen of the Dugong of late years, but we remember well having seen shoals of them on the coast of Aripo, during the pearl fishery of 1835 and 36.

Mr. Layard says that it is common in the bay of Calpentyn.

The specimen in the Army Medical Officers' Museum was obtained near Colombo. The flesh of this animal is far from being disagreeable; it is not unlike pork.

b. Ordinaria.

GENUS. DELPHINUS. *Linn.*

Teeth in both jaws. Forehead convex, and the muzzle forming a kind of bill in front of the head, more slender than the rest.

Three species of Dolphin are said to be found in the seas surrounding the Island; viz., *D. plumbeus*, Dussum; *D. longirostris*, Dussum; and *D. velox*, Dussum. We have not been so fortunate, since our return to Ceylon, as to have seen a single fresh specimen. In the Army Medical Officers' Museum is the skeleton of one which we are inclined to believe is that of *Delphinus velox*. The dry fish used by the natives called *Comblemas*, is the flesh of a species of Dolphin, brought from the Maldives.

The Editor of the *Colombo Observer*, gives the following interesting account of the dying appearances of two Dolphins recently caught on the Colombo coast:

"With reference to what is said of the sensitiveness to sound displayed by these creatures, we may mention that the aural orifices tho' small were easily distinguishable, a fluid even exuding on pressure It was painfully interesting to notice the humanlike eye with the eyelids instantly closing over them as a finger or any other substance was brought into close contact with them, and tears moistening them, secreted by a true lachrymal gland. Still more melancholy was it to listen to the plaintive sounds they sent forth as they lay panting and dying. As the beautifully fitting valve of the "blow hole" opened for inspiration the sound emitted resembled the cry of a kitten or young bird, while the groans which occasionally accompanied a strong expiration, bore a painful resemblance to those which proceed from a strong man in mortal pain. In dying, the colour of the lower parts of the body gradually changed from a yellowish white to a beautiful irridescent pink. The native fishermen did not seem much elated by the capture. They said that when cut up and sold for food the creatures would only realize about 6*s.* each."

GENUS. PHOCÆNA. *Cuv.*

No beak or rostrum; snout short and convex. Teeth numerous in both jaws; a dorsal fin.

We have identified the species of Porpoise seen occasionally in our seas, with *Phocæna communis*, Lesson. It is of a blackish colour above, and whitish beneath.

Whales (BALÆNÆ) are very rarely seen; a dead one is occasionally stranded. The skeleton of one cast ashore, some 20 years since at Mount Lavinia, is still in the Museum at Colombo.

PART II.

BIRDS OF CEYLON.

BIRDS OF CEYLON.

The Ornithology of Ceylon, has of late years been so well worked out by Mr. Blyth, from specimens sent to him by Dr. Templeton and Mr. Layard, that our labours in this department of the Zoology of the Island have been comparatively easy; particularly, as we have been able to submit to Mr. Blyth all species of doubtful identification. While in England, too, we took every opportunity of comparing specimens sent to us from Ceylon with those in the British museum, in doing which, we received the valuable assistance of Mr. G. R. Gray. The Catalogue of Ceylon birds, may therefore be depended on for general accuracy; a few mistakes may have crept into the nomenclature, as we have been long away from a Library of reference. The works which have been our guide in the formation of this catalogue, are Mr. Gray's Genera of Birds, the catalogues of the British museum, and the various papers of Mr. Blyth found in the Journals of the Bengal Asiatic Society. We have not availed ourselves of Mr. Layard's list of birds published in a late No. of the Annals and Magazine of Natural History, as no reference is therein made to the authorities from which the names given are derived. To Mr. Layard much credit is due for discovering so large a number of birds new to the Fauna of Ceylon, all of which fell by his own gun. He has also had the great advantage of having all his specimens identified by Mr. Blyth; and therefore, although our lists do not always agree in the nomenclature used, we doubt not that a joint list of synonyma would remove much of the apparent discrepancy.

It would have given us great pleasure, to have described each bird in the same manner as we have the Mammals of Ceylon, had we at the outset of our researches had this object in view, and reserved duplicates of all specimens, we have from to time distributed among friends in India and England. It is our intention to do so at some future period, should we remain long enough in the Island. For the present, we shall enumerate the birds of the Island which have come under our own notice and those found by other collectors and by them submitted for Mr. Blyth's identification, notices of the same being already published in the Journals of the Bengal Asiatic Society.

As an introduction to the catalogue, a few remarks on the general features of the Ornithology of the Island will doubtless be desirable. With this object the following observations are made.

Europeans arriving in the Island for the first time, are frequently disappointed in not finding as many birds with gorgeous plumage as they had been led to expect from accounts of travellers. But after a more lengthened stay and a more intimate acquaintance with the feathered race, they cannot but conclude with us, that although the Ceylon birds are not in general as beautiful as those of South America or Africa, there are many which can equally claim our admiration, not only for their handsome plumage and elegant forms, but likewise for their song.

It is not uncommon to hear it said "that in tropical countries, where brilliant and varied colours have been granted to the birds and flowers, song has been denied to the one and fragrance to the other" Would that we had the pen of a Gosse* to show that this is as regards Ceylon birds and flowers, "one of those flippant generalisations which people are fond of repeating, originally made without investigation and perpetuated without enquiry."

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* The author of "Birds of Jamaica."

The music of our Ceylon birds is endeared to us from early associations; and when after the lapse of many years we again hear the thousand well known little notes, with which our ears were regaled in childhood, it is like listening to the songs of other days. Night after night, in temperate climes, we anxiously waited for the Nightingale's evening song; but here, in this land of the sunny east, we are charmed with, as melodious sounds at any hour of the day, we choose to ramble in the country, but more particularly in the morning. The long continued rich and joyous notes of the *Copsychus saularis,* (Magpie or Dial bird of Europeans) and of its forest representative *Copsychus* (Kittacincla) *macrourus,* (the long tailed thrush), can almost rival the song of any other known musical bird.

There are several other songsters besides these, among which are found, meadow chats, and grass warblers. The Robin of Newera Ellia, (*Patrincola atrata*) is a new species; the sweet mellow notes of this bird remind the European of his home; and the black bird, *Merula Kinnisi,* so like the English bird, has a song too, which gladdens the heart of the invalid while breathing the cold morning air of this Eastern Sanatarium. The tailor bird also, and the various forms of honey birds, contribute to make the mountains of Ceylon doubly agreeable to the European long absent from his native land. In the forests of the low country, the cooing of numerous doves and pigeons, and the short little notes from a host of finches, flycatchers and bulbuls, mixed with the harsh tones of the various kinds of barbets (*Kootooroo,* Sing); crows, woodpeckers, peacocks and parakeets, combine to make at times these forest recesses anything but silent or monotonous. At night are heard sounds of a discordant nature. The shriek of the Owl, particularly of the devil bird, (*Syrnium Indrani*) is truly appalling. The superstitious natives listen to these dismal cries with great horror; some death or less misfortune is apprehended when an Owl sings nightly over a hut, or on a tree overshadowing it.

The principal feature in the Ornithology of Ceylon, is the vast number of birds of prey, parakeets, wagtails, flycatchers, thrushes, finches, and water birds, found in nearly all parts of the Island.

Of ACCIPITRES, or Birds of Prey, our list contains 20 diurnal, and 8 nocturnal species. Hitherto no species of Vulture has been observed. The reported existence of a species of *Gyps* requires confirmation. The Sea Eagle, *Pontoäetus* (Blagrus) *leucogaster*, is the largest known bird of prey in the Island; and next to it in size is the beautiful crested Eagle, *Spizaetus Nipalensis*, which is, however, the most handsome species of this class of birds. This elegant crested Eagle, is occasionally seen in the highest mountains. The only specimen we succeeded in procuring was shot on a mountain, 4,000 feet high, near Badulla. The Peregrine Falcon, is found at Point Pedro. The Kestrel is very common all over the Island;—even found at Newera Ellia. This bird is very numerous at Trincomalie, where it is seen on the esplanade in search of lizards, insects and small birds. The habitats of most of the other species also are in the maritime provinces. The most frequently seen species are the Sparrow Hawks, Hen Harriers, and the red and black Kites. *Accipiter nisus* is very rare, we have seen only one live specimen.

The Owls, or nocturnal birds of prey, are not quite so numerous. The new species, *Athene Castanotus*, was first brought to Mr. Blyth's notice by Dr. Templeton; it is strictly a mountain race. *Scops sunia*, a very small reddish-yellow Eared Owl, is occasionally seen in the very highest parts of the Island; the allied species, *Scops pennata*, is a low country bird. *Ephialtes lempigii* and the large *Ketupa Ceylonensis* are very common even in the low Kandian hills. *Strix Javanica*, an owl closely allied to the English barn owl, is found in the Jaffna district.

Of CAPRIMULGIDÆ, or Goat suckers, there are species of two genera. *Batrachostomos moniliger*, is a new species discovered by Mr. Layard in the Kandian country. It is easily distinguished from species of Caprimulgus by the lateral edges of its upper mandibles being rounded and overlapping the lower ones. The Goat-suckers, better known in Ceylon as the night jars or hawks, are very numerous. They are generally seen immediately after sunset, on open plains or over lakes and pools, catching flies and other insects with their enormous gapes; their flight is low but very rapid. A new species (*C. Kelaarti*, Blyth,) found at Newera Ellia, appears to be identified with a species on the Neilgherry hills. The marshy plains of Newera Ellia swarm with them at dusk of the evening.

HIRUNDINÆ, or Swallows. Two species are confined to the highlands, *Hirundo domicola* and *H. hyperythra*; the former is known in Newera Ellia as the House swallow, and at the Neilgherries as the Bungalow swallow, from its building its nest of mud, sticks and feathers under the roofs of houses. We have observed this swallow as an occasional visitant of Kandy. *H. hyperythra* is the red-breasted swallow of Kandy and its neighbourhood. We have never seen it on higher parts than Pusilawa, certainly not at Newera Ellia during our residence there of eight months. *H. gutturalis*, is the common swallow of all the maritime provinces; they are usually seen in large flocks over pools of water or muddy land; and they very often perch on small bushes. Large flocks of them are also seen on the ground. In the morning they are generally on the wing, catching the insects which are so abundant just after sunrise.

Of CYPSELINÆ, or Swifts, the species which produces the edible nest claims our first attention. It is the *Collocalia brevirostris* of McClelland, vel *C. nidificans*, Gray. These birds fly generally very high; a few only are seen at a time. They have been known for years to build their glutinous nests in a cave near Caltura. At Newera Ellia also, this swift is a visitant in the months of March and April. We have heard from very good authority, that some years ago baskets of the edible nests were obtained from a cave on the Pedrotallagalla hill. Very nutritious soup was made of them for the invalids who at that time resided at Newera Ellia. The very common palm swift of the Island is the *Cypselus Balisiensis*: most frequently found in the maritime provinces. The gigantic spiny tailed swift, *Acanthylis Caudacuta,* is very rarely seen, and only on the Alpine plains. The crested swift *Macropteryx coronatus,* is very numerous in the Central province, and is frequently seen in the town of Kandy flying over the houses.

Of CORACINÆ, or Rollers, only one species, (*Coracias Indica*) is known to us, but we believe there is also a species of *Eurystomus.* The Indian Roller is more frequently found in the jungles of the low country; rarely more than one or two at a time, usually perched on a tree and watching the movements of insects. It also feeds on fruits.

Of TROGONINÆ, only one species is known to us, *Harpactes fasciatus,* the fasciated Trogon, (*Ratuwon-kondea* of the Singhalese), seen in pairs in dense forests; they feed on insects. At Newera Ellia they are sometimes very numerous; rare in the Northern parts of the Island.

Of HALCYONINÆ, or Crabhunters (Kingfisher) the most numerous species is the *Halcyon Symrnensis. Halcyon capensis* is very seldom seen. The beautiful dwarf King fisher, *Ceyx tridactyla,* is a very rare bird; the only specimen we have seen is one which the late Mr. H. Templer (Police Magistrate of Matelle) caught, when it flew into his house through a window.

Of ALCEDINÆ, or (true) Kingfishers, the small blue one, *Alcedo Benghalensis,* is most numerous in the maritime provinces, and not very uncommon even on the Kandian hills. Seldom are more than two seen at a time; generally, only one. They usually fly over fresh water streams or pools, and rest occasionally on small shrubs growing on the water side, and on sticks that may be floating on the water. *Ceryle rudis,* is less numerous, we have only seen it in the South western province. Both build their nests in holes on the muddy or sandy banks.

Of **MEROPINÆ**, or Bee-eaters, there are three beautiful species, not easily distinguished at a distance one from the other, owing to the prevailing colour in all being light green. The largest species and one more generally distributed is the *Merops philippinus.* The other two species are more confined to the low country. *M. quinticolor,* so like *M. viridris,* is found in the North and North Eastern provinces, where the latter is the species most frequently seen. It is very amusing to see these birds perched on branches of trees, watching for small insects. They are sometimes seen in small flocks of six or eight searching for food, which chiefly consists of Coleopterous insects.

Of **UPUPINÆ**, or Hoopoes, only one species is known, and that only seen in some parts of the Island. In the park, at Bintenne they are very numerous. We have also specimens of the Hoopoe from Dimbodla and Point Pedro.

Of **PROMEROPINÆ**, or Sun-Birds, there are three well-known species; and another of the identification of which we have some doubt. Sun birds are very numerous, and are seen in nearly all parts of the Island at different periods of the year. *Nectarina Zeylonica* and *N. Maharrattensis* are the most common species. The latter is better known as the honeybird, though all the species feed not only on the nectar of flowers, but also on insects. *Dicæum Tickelli* is a very numerous species in the Kandian country. It is a popular error in Ceylon, to call this class of birds "humming birds," a term applied to a very different class of lovely birds of the New World, with far richer plumage than our sun birds, which depend for much of their beauty on the evanescent effects of the sun's rays.

Of MELIPHAGINÆ, or Honeyeaters, we have only one, a green species, peculiar to the hills. They are said to live on honey, insects and fruits.

Of SITTINÆ, or Nuthatches, we only know one species, called in Ceylon the blue creeper. It is very abundant at Newera-Ellia and the neighbouring forests. It is very like the true creeper in its habit of running up and down the trunks of trees in search of insects. It also feeds on small nuts.

MALURINÆ, or Soft-tailed Warblers. The tailor bird, *Orthotomous longicauda*, is one of the most widely distributed birds of Ceylon, its nest, made of leaves sewn together with fibrous thread, is a very familiar object with the collector. This bird feeds on the small insects and their larvæ, which are found on trees. It hops about, from branch to branch, with the tail turned up; and frequently its motions are accompanied with short little notes. The grass warblers are also very numerous, particularly *Cisticola cursitans* which frequents the grass plains: very common at Trincomalie. In walking across the esplanade at dusk of the evening, these birds are often disturbed, and in their flight a few pleasant notes are warbled. The other species, *C. omalura*, is found in great abundance on Horton plains and Newera-Ellia, where they build their nests among the long patna grasses and reeds. *Drymoica valida* is a new species described by Mr. Blyth, and hitherto seen only in Ceylon.

Of LUSCININÆ, or True Warblers, our catalogue presents only one species, *Acrocephalus dumetorum*. The only place where we met with it was Newera-Ellia. It is a very shy bird and not often seen; its song is not the sweetest heard on those plains.

Of ERYTHACINÆ, or Robins, there are species of several genera. *Copsychus Saularis*, the white and black, or magpie robin of the low country, has a very sweet song. Even at mid-day, a solitary bird will perch on a tree in a garden or by the roadside and sing for several minutes together. Its song is best heard in the morning, and can be easily distinguished from the less musical voices of other birds. They feed on moths, grasshoppers, and ground insects. The still sweeter notes of its jungle cousin, the long tailed thrush, *Kittacincla macrourus*, is almost unrivalled. No bird's song in Ceylon is so rich; it consists of several notes, several times repeated. This songster is, we believe, only seen in the Northern parts of the Island. It is not uncommon about Trincomalie; one flew even into a house in Fort Fredrick. The densest forest is however its home, where its song is more frequently heard in the evenings. The meadow chats, *Pratincola caprata*, and our new species *P. atrata*, are also sweet singers. The latter species is confined to the highlands; we have not met with it on lower hills than Rambodde. It is very numerous on the plains of Newera-Ellia; sometimes seen in pairs, and often singly. The male bird perches on a twig of a small plant, or on a reed, and the female on the ground not far off; but rarely are more than two or three pairs seen in the same locality. They frequent gardens and flower beds in search of insects. *P. caprata* is found in the lower parts of the Kandian country. The sooty warbler, *Thamnobia fulicata*, is known in Ceylon as the black robin; it is very numerous in the maritime provinces, and even in the Kandian country it is very frequently met with, generally in gardens and on roofs of houses. It is easily known from other robins by its red vent and the peculiar jerk it gives the tail; the female is of a dusky brown colour. The note of this bird is not so rich as that of the other robins we have noticed.

PARINÆ, or Titmice. The ashy titmouse, *Parus cinereus*, is the only species we know of in the Island. It is very numerous on the highlands, particularly at Newera-Ellia and Dimboola. Its habits are very like those of the English bird, which it also so much resembles in appearance.

MNIOTELTINÆ, or Bush Creepers, are common. *Zosterops palpebrosa* and *Iora typhia* are found in most parts of the Island. We fear that the Newera-Ellia *Zosterops* is wrongly identified. It is of a darker green than the common *Z. palpebrosa*; both have very distinct white rims round the eyes. *Iora Zeylonica* is one of the birds we identified, when in England, from stuffed specimens.

MOTACILLINÆ, or Wagtails, are very numerous in all parts of the Island we have visited. *Motacilla boarula* is generally seen on the highland patnas. *M. Indica* and *Budytes viridris* are found in great abundance on the meadows and banks of lakes and streams in the low country. The pipits are also abundant in meadows and open pastures, particularly *Corydalla Richardi.* This species and *C. rufula* are not seen in very high lands. At Newera-Ellia, *C. striolata* is very common. These pipits are called in the Island sky larks. They rise on the wing like larks and they sing also as they mount in the air. In search of larvæ and worms they follow the tracks of cattle when grazing in the field.

Of TURDIDÆ, or Thrushes, there are several genera. Of ant thrushes, FORMICARINÆ, the new species which we have called after Mr. Palliser of Dimboola, *Brachypterix Palliseri*, is a rare bird, found at Newera Ellia and Dimboola. *Alcippe nigrifrons*, is another mountain species. The short tailed *Pitta* is a beautiful bird known as the tailless thrush. It is found in great abundance in the maritime provinces, and not unfrequently even in the highlands. They are seen either singly or in pairs on the ground searching for worms; they are very quick runners; seldom seen flying when disturbed.

Of TURDINÆ, or True Thrushes, the only species which can be said to be very numerous in the Island, is a new species of blackbird found at Newera Ellia, which we have named after our valued friend Dr. Kinnis, who gave us our first lesson in Zoology, and to whom Ceylon is indebted for the once rich and well arranged Museum at Colombo, which at one time created a general taste for Natural History in the Island. Ward's Thrush is another mountain species found at Dimboola.

TIMALINÆ, or Babblers. There are several species of *Garrulax*, although only a new one appears in our list; the others we have not identified. *Pomatorhinus melanura* is a mountain species. The Dung Thrush, sometimes called the "seven brothers" from seven being the number of these birds generally seen together, are very common, especially *Malacocercus striatus*. Small flocks of these birds are seen in all maritime provinces: their song is very peculiar and cannot be mistaken for that of any other thrush; it consists of repeated whistling notes, which coming from several birds at a time make a strange clattering noise. They are generally found on the ground and low bushes, and very frequently on dung hills. They live upon fruits and insects. *M. rufescens*, is found at Newera Ellia.

ORIOLINÆ, or Orioles. The mango bird, *Kacooralla* of of the Singhalese, is the black headed Oriole, (*Oriolus melanocephalus*). It is widely distributed, but more numerous in the low country. They are generally seen in pairs flying from tree to tree in search of fruits; they also feed on insects. The natives keep them in cages where they become quite tame. The other species is known to us only by specimens in the Colombo Museum.

PYCNONOTINÆ, or Bulbuls, are very numerous, particularly *Pycnonotus hemorrhous*, the *Kondatchee* of the Portuguese and Kondé cooralla of the Singhalese. *Criniger Ictericus* is also a common species in the low country. Our green yellow eared species, *P. penicillatus*, is found in great abundance at Newera Ellia, where also *Hypsipetes Neilgheriensis* is occasionally seen. The songs of these birds are of a whistling kind. Fruits are their chief food.

MUSCICAPIDÆ, or Fly catchers, are seen in great abundance. *Cryptolopha cinereocapilla*, is a small green flycatcher found at Newera Ellia. The so called Ceylon Bird of Paradise, with a long flowing tail, sometimes of a brown colour and at other seasons white with a blackish head, is the *Tchitrea paradisi.* It is more numerous in the South western provinces than in any other; rare in higher parts than Kandy. *Stoporala melanops*, a blue flycatcher, is more frequently seen in the highlands.

CAMPEPHAGINÆ, or Caterpillar-catchers, are also flycatchers. The flame coloured species, *Pericrocotus flammeus*, is the most numerous; they are even common on Horton plain.

Of DICRURINÆ, or Drongo Shrikes, several species are found. *Edolius Malabaricus*, or King Crow, is seen in all parts, generally in pairs; in the open fields they perch on the backs of cattle. Mr. Blyth has added two new species of *Dicrurus* from Ceylon. We have also seen a mutilated bird in Kandy, of a dark blue body and black head, which we have added to the List of Birds as a species of Irena. It was shown to us as a very rare bird.

LANINÆ, or Butcher Birds, are not common, they are said to fix their prey on a thorn while engaged in feeding on it; they are often seen in the Northern provinces. We are indebted for specimens of the grey backed shrikes to Mr. Layard.

Of GARRULINÆ, or Jays, the beautiful mountain Jay *Cissa puella*, which Mr. Blyth described from a specimen sent to him by Mr. Layard, is very common at Newera Ellia. They frequent the fields there generally in small flocks, in search of worms. They are also seen in pairs perched on trees. They make a loud harsh noise in flying. There are, we believe, one or two species of Garrulus in the Island.

CORVINÆ, or Crows. Two species are found in the Island *Corvus splendens* and the common carrion Crow, *C. culminatus;* their characters and habits are well known. Their numbers are far from being diminished in towns. They are very useful scavengers, though at times the noise they make is very disagreeable. In open plains hundreds will be seen congregated together in solemn conclave, as if discussing some important matter.

Of STURNIDÆ, or Starlings, (in which are included the grakles), there are several genera. *Gracula religiosa*, the Brahmin Maynah, or grakle, is a very common bird in the low country of the Southern provinces, less numerous in the Kandian country, and still more rare in the alpine parts, where a new species with only two yellow lappets on the head, *Gr. ptilogenys*, is very abundant. Both species are prized by the natives for the facility with which they can be taught to chatter a few of the native words. They are generally found in pairs on trees; sometimes as many as a dozen are seen together flying across the jungle. Their song consists of a whistle, but they more frequently make a harsh noise. They live chiefly on fruits, but in a domesticated state will partake of boiled rice and bread. *Pastor roseus*, the rose-coloured starling, we only know of from specimens sent by Mr. Layard from Point Pedro. *Heterornis* (*Sturnia*) *pagodarum*, Pagoda starling, is common in the Northern provinces; a few are occasionally seen even in Fort Frederick, Trincomalie: they feed on insects and grain. The sub-crested Maynah and Paradise Maynah, *Goon Cowdea*, of the Singhalese, are very abundant on fields and open plains, which they frequent in search of insects and worms. Small flocks of six or eight are often seen, but generally a smaller number. They are not timid birds; one or two will perch on the back of a bullock, while others will be feeding below on the insects which the bullock's feet have disturbed.

FRINGILLIDÆ, or Finches, are very numerous. The weaver bird (*Ploceus*) belongs to this family: their long pendant woven nests are objects of great curiosity. Besides the two species we have enumerated, there are others found by Mr.

Layard. The finches, (Fringillinæ), are very abundant in all parts of the Island; the most common are *Amadina undulata* and *A. Malabarica*. A species of *Amadina* (found at Newera Ellia) is supposed by Mr. Blyth to be identical with *A. pectoralis*, a new species of Dr. Jerdon. The common Indian sparrow is as numerous in Ceylon as sparrows are in other parts of the world. We have not however met with it in the Alpine districts. A species of bunting and crossbill are also found in the Island.

ALADINÆ, or Larks, are not very common. Two species have been identified: their song is not so rich as that of the English lark. *Pyrrhulauda grisea* is very abundant in the Northern provinces; large numbers of them are seen on the esplanade at Trincomalie; and on the roads too, where they seek for food.

BUCETORINÆ, or Horn bills, are known in the island as "Toucans" (*Malakandetta*, *Sing*). The large species, with the double casques, are found in great abundance in the Northern provinces. *B. pica* is common about Kandelle and Minery lakes. They feed on fruits and insects.

Of the family PSITTACIDÆ, or Parrots, there are only Parakeets in the Island. Large flocks of them are seen flying together from one part of the jungle to the other. Near towns also they are very numerous, particularly the larger species. The beautiful purple headed species, *Palæornis Calthropæ*, called by Mr. Layard after the accomplished and faithful companion of his labours, is a species found by him on the Kandian hills. It is the only parrot on the Newera Ellia range. Pridham, among all his other great mistakes, enumerates the Grand Lory among the birds of the Island. The specimen of the Lory in the Colombo Museum is from Australia. This makes us believe, that he must have had a Catalogue of that Museum, which includes species from many parts of the world, before him when he framed his list of Ceylon animals.

CAPITONINÆ, or Barbets, (Kootooroo, Sing), are found in most parts of the Island, especially the smaller species. The peculiar interrupted notes of these birds have not been unaptly compared to the reverberating sounds made by a stone thrown on ice, or to distant hammering of metal.

Of PICINÆ, or Woodpeckers, there are many; among them one new species, *Picus gymnopthalmus,* Blyth, found by Mr. Layard. The orange coloured Woodpecker and the large red one are very common. The latter, *Brachypternus Ceylonus,* is found also in great abundance at Newera Ellia, where *Picus chlorophanes,* is very frequently seen. The ground Woodpecker, *Micropternus gularis,* was found by Mr. Layard.

CUCULIDÆ, or Cuckoos, abound in the Island. *Eudynamys Orientalis* is very common in all the maritime districts and lower Kandian provinces, where also is found *C. tenuirostris.* The ashy mountain species *C. micropterus* is rare; found at Dimboola. The Philippine Cuckoo, *Centropus philippensis,* (Jungle Crow of Ceylon sportsmen, *Atty kokoola* Sing) is more abundant in the low country than in the highland. Mr. Layard has discovered a new species of Centropus with a yellow bill, which Mr. Blyth names *C. chlororhynchos.* The crested Cuckoo is also common in the low country, particularly in the Northern provinces. The *Malakohas* (Sing), are also of the Cuckoo tribe. *Phenicophaus Pyrrhocephalus* is not very numerous, it is confined to the higher parts of the Southern provinces; *Zanclostomus viridirostris* to the Northern.

COLUMBIDÆ, or Pigeons. The *Trerons* (Battagoya, Sing.) are found in large flocks. *T. chlorigaster* is one of the birds Mr. Layard has collected at Point Pedro. The Mahavillagoya, (*Carpophaga Sylvatica*), is a very large handsome species and much sought after for its flavour. We have not seen it in very high lands. *Palumbus Torringtonii,* is the Newera Ellia *Mahavellagoya,* nearly allied to, if not a variety of *P. Elphinstonii* of the Neilgherries. It is an arboreal species, seen only in pairs; flies high and in long sweeps. Their nests are found on lofty trees. We have seen this pigeon as low down as Gampola, (about 2,000 feet); handsome specimens from thence were sent to us by Mr. Christoffelsz de Saram. The flavour of this species is far superior to that of any other in the Island.

The Rock pigeon, *Columba intermedia,* the origin of the common Indian domestic pigeon, is very like *C. livia.* This pigeon is found in great abundance on the rocks at Trincomalie: the well known Pigeon Island in this Coast, derives its name from large flocks of this bird being found there: they build their nests in rocky crevices. They are frequently seen to come into the dove cote and remain for days with the domesticated variety. *Calcophaps Indica,* the handsome ground pigeon, is also very numerous, even on the highlands as far as Pusilawa; they are seldom seen in large numbers, generally only a pair; they fly very low but very swiftly. They will live in confinement for months. The turtle doves are very abundant, particularly *Turtur Suratensis.*

The first in Order GALLINÆ, stands the splendid Peacock, *Pavo cristatus.* These birds, so much admired in England in a domestic state, are seen in all their native magnificence in many parts of the Island. They are found in greatest abundance in the Northwestern provinces. They are also sometimes seen in the neighbourhood of Newera Ellia. Seldom are more than a few pairs seen together, but more frequently only a couple are seen feeding on the road side. We have also seen flocks of some twenty or thirty on open plains.

The Ceylon representative of the sub-family, GALLINÆ, or jungle Fowls, is *Gallus Lafeyetti,* Lesson. This handsome fowl is peculiar to Ceylon. It is not, as is generally supposed in Ceylon, of the same species as the jungle fowls of India. The dark purple spot under the chin and neck readily distinguishes it from other species. Although this bird is so common in the Island, there was in England a few years ago only a pair in the British Museum; and as much as three giuneas were offered for another. The female of it is considered by Mr: Blyth to be *Gallus Stanleyi* of Gray, figured in Gray's Illustrations of Indian Zoology. Mr. Gray makes it, we believe, to be the hen of *G. Sonnerattii.* The jungle fowl is found in all parts of the Island: very abundant at Newera Ellia and Trincomalie. They are often seen on the high roads; when disturbed they run quickly into the jungle, but seldom fly. They soon die in confinement. Hybrids of this fowl and the domestic species are occasionally met with in the native villages. Attempts have been made to domesticate the indigenous bird, by having its eggs hatched by domestic fowls, but the chickens thus obtained rarely reached maturity. A live pair of this fowl we believe has not yet reached England.

The double spurred Partridge *Gallo perdix Zeylonensis,* the *Haban Kookoola* of the Singhalese, is also another gallinaceous bird confined to Ceylon. These birds are very numerous at Newera Ellia and Dimboola. They are also found in the Southern maritime provinces. Those found in the highlands are larger birds and of a darker plumage. There is a good figure of the cock in Pennant's work. The Indian Partridge is abundant in the Jaffna district, they are scarce elsewhere. Quails are very numerous in most parts of the Island. A species of Bush Quail is also found in the Northern provinces.

Order GRALLÆ, has many genera and species in the Island. Among CHARADRIDÆ, are found the Marbled Plover and Goa Sand Piper: they are abundant in the maritime districts. *Cinclus interpres and Esacus recurvirostris* are the least common species. The small plovers and sand pipers are very abundant.

ARDEINÆ, or Herons are also birds met with throughout the low country, and also in some of the highland districts. At Newera-Ellia we have not seen any. The most common species is the *Cannakoka* Sing, or white paddy bird, *Ardeola leucoptera.* The great white Heron, *Herodias alba,* is less frequently seen. *Ardea Cinerea* is rare. The large purple Heron is found in the Northern parts of the Island. The spoon-bill, *Platalea leucorida,* is very abundant in the North Eastern provinces: they are brought for sale at the Trincomalie market. Natives consider it a great dainty; it is of too fishy a flavour to the European palate.

CICONINÆ, or Storks. The Adjutant we saw many years ago brought alive to Colombo from the North of the Island;—a specimen is we believe still in the Museum. Mr. Layard informs us that he has heard of their existence some 40 miles from Point Pedro. The large Violet Stork, *Ciconia leucocephalus,* is found at the large lakes in the Northern provinces: very abundant at the Minery lake. There is also another species of a black colour.

Of TANTALINÆ, or Ibises, there are three species equally numerous in the Northern parts of the Island; they are scarce in the Southern provinces.

SCOLOPACIDÆ, or Snipes. The Whimbrel and Curlew are found in the Northern parts of the Island. Several species of long shanks are found in all the maritime provinces. The painted snipe, *Rhynchæa Benghalensis,* and the common Indian snipe, *Gallinago stenura,* are very abundant. *Gallinago Scolopacinus* "the English snipe" is found only in some of the highland districts. We have seen a few at Newera-Ellia. The Jack snipe is reported by sportsmen to exist also in the Island. The woodcock, *Scolopax rusticola,* the same as the European species, is found on Horton plain and occasionally at Newera Ellia. We have not seen the bird in its feathers, but we have seen a couple of birds called "woodcocks" at a dinner table which tasted uncommonly like the birds of that name. We have no doubt of its existence in the Island, as several English sportsmen assured us of their having shot it. The woodcock is well known in India.

Rails and Gallinules (*Corawaka* Sing.) are common in most parts of the Island. The latter, very scarce in the North Eastern provinces. Of PARRINÆ, or Screamers, the only species in the Island is *Hydrophasianus Sinensis.* It is very rarely seen.

Order. ANSERES. The reddish Flamingo is found in the Northern parts of the Island, and common in the Jaffna district. The Royal duck, *Sarkidornis Regia,* is found on the large Northern lakes. The other species of ducks, teals, &c. are more numerous in the Northern provinces than in the Southern parts of the Island, where the lakes are not so numerous nor so very large.

LARIDÆ. Gulls, Terns and other sea birds are very abundant on the coasts of Ceylon.

PELICANIDÆ. The Darter or snake bird, is found on large lakes. The Pelican is most common on salt water lakes and estuaries. Three or four pairs are seen at a time, loading their membranous bags with fish, and then retiring to some quiet place on the banks and leisurely consuming their prey.

In presenting the following list of Birds of Ceylon, we are enabled to supply descriptions of the new species which have lately been added to the Fauna of Ceylon, from the notes of Mr. Blyth, which will be found in the Appendix to this work.

Our list of Birds found in the Island contains nearly 250 species, out of which according to Mr. Blyth the following species only are peculiar, so far as at present known, to this Island.

PALÆORNIS CALTHROPÆ *Layard,* J. A. S. B. xviii, 800 xix, 334.

LORICULUS ASIATICUS, (*Latham*). J. A. S. B. xviii, 801.

BUCEROS VIOLACEUS, *Wagler.* J. A. S. B. xviii, 803.

PICUS GYMNOPHTHALMOS, *Blyth.* J. A. S. B. xviii, 804.

BRACHYPTERNUS CEYLONUS, *Forster.*

B. ? RUBESCENS, *Vieillot.*

MEGALAIMA FLAVIFRONS, *Cuvier.*

M. RUBRICAPILLA, *Gmelin.*

CENTROPUS CHLORORHYNCHOS, *Blyth.* J. A. S. B. xviii, 805.

PHŒNICOPHAUS PYRRHOCEPHALUS, *Forster.*

BATRACHOSTOMUS MONILIGER, *Layard, Blyth,* J. A. S. B. xviii, 806.

CISSA PUELLA, *Blyth,* J. A. S. B. xviii, 810.

GRACULA PTILOGENYS, *Blyth,* J. A. S. B. xv, 285.

GARRULAX CINEREIFRONS, *Blyth,* J. A. S. B. vol. 1851.

MALACOCERCUS STRIATUS *Sw*; if really distinct from M. Benghalensis, *Brisson.*

M. RUFESCENS, *Blyth,* J. A. S. B. xvi, 453.

DRYMOICA VALIDA, *D. robusta, Blyth,* J. A. S. B. xviii.

CISTICOLA OMALURA *Blyth,* J. A. S. B. vol. 1851.

POMATORHINUS MELANURUS, *Blyth,* J. A. S. B. xvi, 451.

ALCIPPE NIGRIFRONS, *Blyth,* J. A. S. B. xviii, 815.

DRYMOCATAPHUS FUSCOCAPILLUS, *Blyth,* Ibid.

OREOCINCLA SPILOPTERA, *Blyth,* J. A. S. B. xvi, 142.

MERULA KINNISI, *Kelaart, Blyth* J. A. S. B. vol. 1851.

PRATINCOLA ATRATA, *Kelaart, Blyth,* Ibid.

BRACHYPTERYX (?) PALLISERI, *Kelaart, Blyth,* Ibid.

HIRUNDO HYPERYTHRA, *Layard, Blyth,* J. A. S. B. xviii.

TEPHRODORNIS AFFINIS, *Blyth,* J. A. S. B. xvi, 473.

DICRURUS EDOLIFORMIS, *Blyth,* J. A. S. B. xvi, 297.

D. LEUCOPYGIALIS, *Blyth,* J. A. S. B. xv, 298.

PYCNONOTUS PENICILLATUS, *Kelaart, Blyth,* J. A. S. B. vol. 1851.

P. NIGRICAPILLUS, (*Drapiez*).

TRERON POMPADORA, (*Latham*). In need of identification, and supposed by Mr. Strickland to be the same as Treron Malabarica, *Jerdon.*

GALLUS STANLEYI, *Gray; G. Lafayettei*, Lesson; G. lineatus *Blyth.*

GALLOPERDIX ZEYLONENSIS, *Gmel;* Tetrao bicalcaratus *Pennant.*

"Others" observes Mr. Blyth "are doubtfully distinct, as Megalaima Zeylanica from M. caniceps of S. India; Leucocerca compressirostris (J. A. S. B. xviii, 815), from L. albofrontata; and we might here have placed Malacocercus striatus as doubtfully distinct from M. Benghalensis; Dicrurus leucopygialis from D. Cæsulescens, and Pomatorhinus melanura from P. Horsfieldi. Corvus splendens and Acridotheres tristis are of a much darker hue in Ceylon than in N. India; so is Micropternus gularis of Ceylon as compared with the bird of S. India. Hypsipetes Nilgiriensis is, on the contrary, paler in Ceylon, and more like the Himalayan H. psaroides. Acrocephalus dumetorum (xviii, 815) has, in Ceylon, a distinguishing greenish shade. The difference of Palumbus Elphinstonii of Ceylon from that of the Nilgiris has already been indicated; and, lastly, Oriolus melanocephalus of Malabar and Ceylon may be constantly distinguished from that of Bengal, Nepal, Assam &c. by the markings of the wings, as especially the quantity of yellow at the tips of the tertiaries; this being much more developed in the Bengal race, in which it occupies the whole outer web of the first and second tertiaries, and about ¾ in of the outer webs of the two next; whereas in the Ceylon and Malabar race it forms merely a series of small terminal spots to the tertiaries; the yellow tips of the coverts of the primaries are also constantly reduced in size in O. Melonocephalus of Malabar and Ceylon."

CATALOGUE
OF
CEYLON BIRDS.

ORDER. ACCIPITRES.

SUB-ORDER. ACCIPITRES DIURNI.

FAM: FALCONIDÆ.

a. AQUILINÆ.

* Aquila Bonelli, *Temm.*	The Genoese Eagle.
* Aquila pennata, *Gmel.*	The Pennated Eagle.
Spizaetus Nipalensis, *Blyth.*	The Beautiful Crested Eagle.
Spizaetus limnaetus, *Horsf.*	The Crested Eagle.
Ictinaetus Malaiensis, *Temm.*	The Black Eagle.
* Hæmatornis Cheela, *Latham.*	The Cheela Eagle,
Hæmatornis spilogaster, *Blyth.*	The Ceylon Eagle.
Pontoaetus leucogaster, *Gmel.*	White-bellied Sea Eagle.
Haliastur Indus, *Bodd.*	Shiva's Kite.

b. FALCONINÆ.

* **Falco Peregrinus,** *Linn.*	The Peregrine Falcon.
Tinnunculus alaudarius, *Briss.*	The Kestrel Falcon.
* **Hypotriorchis chicquera,** *Shaw.*	The rufous headed Falcon.

c. MILVINÆ.

* **Baza lophotes,** *Temm.*	The Cohy Falcon.
Milvus Govinda, *Sykes.*	The Cheela or Govinda Kite.
Elanus melanopterus, *Daud.*	The Black Winged Falcon.

d. ACCIPITRINÆ.

* **Astur trivirgatus,** *Temm.*	The three streaked Kestrel.
Accipiter badius, *Gmel.*	Brown's Sparrow Hawk.
Accipiter nisus, *Linn.*	The Sparrow Hawk.

e. CIRCINÆ.

Circus Swainsonii, *A. Smith.*	The pale Harrier.
Circus cinerascens, *Montague.*	The ashy Falcon.
Circus melanoleucus, *Penn.*	The black and white Falcon.

SUB-ORDER. ACCIPITRES NOCTURNI.

FAM: STRIGIDÆ.

a. SURNINÆ.

Athene castanotus, *Blyth.*	The Ceylon chestnut-winged Owl.
* Athene scutellata, *Gray.*	The hairy Owl.

b. BUBONINÆ.

Ephialtes Scops, *Linn.*	The scops-eared Owl.
Ephialtes sunia, *Hodgson.*	The reddish Owl.
Ephialtes lempigii, *Horsf.*	The lempigi Owl.
Ketupa Ceylonensis, *Gmel.*	The Ceylon eared Owl.

c. SYRNINÆ.

Syrnium Indrani, *Gray.*	The Oulama Owl.

d. STRIGINÆ.

Strix Javanica, *Gmel.*	The Indian Barn Owl.

ORDER PASSERES

SUB-ORDER. I. FISSIROSTRES.

A. F. NOCTURNI.

FAM: CAPRIMULGIDÆ.

a. STEATORNINÆ.

* Batrachostomus moniliger, *Layard.*	Ceylon Oil bird.

b. CAPRIMULGINÆ.

Caprimulgus Maharattensis, *Sykes.*	The Maharatta Goatsucker.
Caprimulgus Kelaarti, *Blyth.*	The Newera-Ellia Goatsucker.
Caprimulgus Asiaticus, *Latham.*	The Indian Goatsucker.

B. F. DIURNI.

FAM: HIRUNDINIDÆ.

a. CYPSILINÆ.

Cypselus Balisiensis, *Gray.*	The common Palm Swift.
Cypselus melba, *Linn.*	The common large Swift.
Cypselus affinis, *Gray.*	The blackish Swift.
Macropteryx coronatus, *Tickell.*	The crested Swift.

Collacalia brevirostris, *McClelland.*	The edible-nest Swallow.
Acanthylis Caudacuta, *Lath.*	The spiny-tailed Swift.

b. HIRUNDININÆ.

Hirundo gutturalis, *Scop.*	The common Indian Swallow.
Hirundo hyperythra, *Layard.*	The red-bellied Swallow.
Hirundo domicola, *Jerdon.*	The Bungalow Swallow.

FAM: CORACIADÆ.

a. CORACIANÆ.

Coracias Indica, *Linn.*	The Indian Roller.

FAM: TROGONIDÆ.

Harpactes fasciatus, *Lath?*	The fasciated Trogon.

FAM: ALCEDINIDÆ.

a. HALCYONINÆ.

Halcyon Capensis, *Linn.*	The Cape King-fisher.
Halcyon Smyrnensis, *Linn.*	The Smyrna King-fisher.
Cyex tridactyla, *Linn.*	The pretty dwarf King-fisher.

b. ALCEDININÆ.

Alcedo Bengalensis, *Gmel.*	The Indian King-fisher.
Ceryle rudis, *Linn.*	The black and white King-fisher.

FAM: MEROPIDÆ.

a. MEROPINÆ.

Merops Philippinus, *Linn.*	The Philippine Bee Eater.
Merops viridis, *Linn.*	The Indian Bee Eater.
Merops quinticolor, *Keill.*	The five coloured Bee Eater.

SUB-ORDER. II. TENUIROSTRES.

FAM: UPUPIDÆ.

a. UPUPINÆ.

Upupa Senegalensis, *Swain.*	The Hoopoo.

FAM: PROMEROPIDÆ.

a. PROMEROPINÆ.

Nectarina Zeylonica, *Linn.*	The Ceylon Sunbird.
Nectarina minuta? *Sykes.*	The smaller Sunbird.
Nectarina Maharattensis, *Lath.*	The short-billed purple Honeybird.
Nectarina letonia, apud, *Layard.*	The long billed Honeybird.
Dicæum Tickelli, *Blyth.*	Tickel's Honeybird.

FAM: MELIPHAGIDÆ.

a. MELIPHAGINÆ.

Phyllornis malabarica, *Lath.*	Malabar Honey Eater.
Phyllornis aurifrons, *Temm* ?	Green Honey Eater.

FAM: CERTHIDÆ.

a. CITTINÆ.

Dendrophila frontalis, *Horsf.*	Blue nuthatch, or Creeper.

SUB-ORDER. III. DENTIROSTRES.

FAM: LUSCINIDÆ.

a. MALURINÆ.

Orthotomus longicauda, *Gmel.*	The rufous headed Tailorbird.
Cisticola cursitans, *Blyth.*	The Grass Warbler.
Cisticola omalura, *Blyth.*	The mountain Grass Warbler.
* Drymoica valida, *Blyth.*	Layard's Grass Warbler.

b. LUSCININÆ.

Acrocephalus dumetorum, *Blyth.*	The mountain marsh Warbler.

c. ERYTHACINÆ.

Copsychus saularis, *Linn.*	The Dialbird.

Copsychus macrourus, *Gmel.*	The long tailed Thrush.
Pratincola caprata, *Blyth.*	The Meadowchat.
Pratincola atrata, *Kelaart.*	The black do., or Newera Ellia Robin.
Thamnobia fulicata, *Linn.*	The sooty Warbler.

d. PARINÆ.

Parus cinereus, *Vieill.*	The ashy Tomtit, or Titmouse.

e, MNIOTILTINÆ.

Zosterops palpebrosa, *Temm.*	The white-eyed Bushcreeper.
Zosterops annulosus, *Swain.*	The mountain Bushcreeper.
Iora Zeylanica, *Gmel.*	Ceylon Bushcreeper.
Iora typhia, *Linn.*	The green Bushcreeper.

f. MOTACILLINÆ.

Motacilla boarula, *Linn.*	The grey Wagtail.
Motacilla Indica *Gmel.*	The Indian Wagtail.
Budytes (*Enicurus*) **viridis**, *Blyth.*	The green Wagtail.
Corydalla (*Anthus*) **Richardi**, *Blyth.*	Richard's Pipit.
Corydalla rufula, *Vieill.*	The rufous Pipit.
Corydalla striolata, *Blyth.*	The mountain Pipit.

FAM: TURDIDÆ.

a. FORMICARINÆ.

Brachypteryx Palliseri. *Kelaart.*	Palliser's Ant-thrush.
* Drymocataphus fuscocapillus, *Blyth.*	——
Alcippe nigrifrons, *Blyth.*	.The mountain Thrush.
Pitta brachyura, *Jerdon.*	The short tailed Pitta.

b. TURDINÆ.

* Oreocincla spiloptera, *Blyth.*	Thrush.
Merula Wardii, *Jerdon.*	Ward's Thrush.
Merula Kinnisi, *Kelaart.*	The Newera Ellia Blackbird.

c. TIMALINÆ.

Garrulax cinereifrons, *Blyth.*	Ashyheaded Garrulax.
Pomatorhinus melanura, *Blyth.*	The Ceylon Pomatorrhinus.
Malacocercus griseus, *Gmel.*	The "Seven Brothers" or dungthrush.
Malacocercus rufescens, *Blyth.*	The Reddish—Do.
Malacocercus striatus, *Swains.*	The Mountian—Do.

d. ORIOLINÆ.

Oriolus melanocephalus, *Linn.*	The black-headed Oriole.
Oriolus Kundoo, ? *Sykes.*	The golden Oriole.

e. PYCNONOTINÆ.

Criniger Ictericus, *Strickland.*	The ashy Bulbul.
Pycnonotus penicillatus, *Kelaart.*	Yellow eared Bulbul.
Pycnonotus flavirictus, *Strickland.*	Bulbul.
Pycnonotus hemorrhous, *Gmel?*	The *Condatchee* Bulbul.
* Pycnonotus nigricapillus, *Drapiez.*	The black-headed Bulbul.
Hemipus picatus, *Horsf.*	The black & white Hemipus.
* Rubigula gularis, *Gould?*	———
Hypsipetes nilgherriensis, *Jerdon.*	Neilgherry Hypsipetes.

FAM: MUSCICAPIDÆ.

f. MUSCICAPINÆ.

Cryptolopha cinereo-capilla. *Blyth,*	The grey-headed Flycatcher.
* Leucocerca compressirostris, *Blyth,*	
Tchitrea paradisi, *Linn.*	The paradise Flycatcher.
Butalis latirostris, *Brie.*	The Flycatcher.
Stoporala melanops, *Blyth.*	The blueish Flycatcher,

FAM: AMPELIDÆ.

a. CAMPEPHAGINÆ.

Pericrocotus flammeus, *Forster.*	The elegant red Flycatcher.
Pericrocotus peregrinus. *Linn.*	The smaller Do.
Campephaga Macei, *Linn.*	Mace's Catterpillar Catcher.

b. DICRURINÆ.

Artamus leuchorrhyncus, ? *Gmel.*	The Shrike.
Artamus fuscus, *Vieil.*	Rufous bellied shrike.
Edolius Malabaricus. *Scop.*	King-crow.
Edolius retifer, *Temm.*	The crested King-crow.
* Dicrurus edoliformis, *Blyth.*	New species of King-crow.
* Dicrurus leucopygialis, *Blyth.*	—— Ditto. ——
Irena ?—sp.	The blue Shrike.

FAM: LANIIDÆ.

a. LANIINÆ:

Lanius tephronotus, *Vigors.*	Grey backed Shrike.
Tephrodornis affinis, *Blyth*	Butcher-bird.

SUB-ORDER. IV. CONIROSTRES.

FAM: CORVIDÆ.

a. GARRULINÆ.

Cissa puella, *Blyth, & Layard.*	The mountain Jay.

b. CORVINÆ.

Corvus splendens, *Vieill.*	The Indian hooded Crow.
Corvus culminatus, *Sykes.*	The common carrion Crow.

FAM: STURNIDÆ.

a. GRACULINÆ.

Gracula religiosa, *Linn.*	The Brahmin Maynah.
Gracula ptilogenys, *Blyth.*	Dr. Templeton's Maynah.

b. STURNINÆ,

Pastor roseus, *Linn.*	The rose coloured Starling,
Hetærornis pagodorum, *Gmel?*	The pagoda Starling.
Hetærornis Malabarica, *Gmel?*	The malabar Starling.
Hetærornis cristatella, *Linn.*	The sub crested Maynah.
Acridotheres tristis *Linn.*	Paradise Grakle, Maynah.

FAM: FRINGILLIDÆ.

a. PLOCEINÆ.

Ploceus Benghalensis, *Linn.*	The Indian Weaverbird.
Ploceus Philippensis, *Linn.*	The Phillippine Weaverbird.

b. FRINGILLINÆ.

Amadina undulata, *Lath.*	The reddish Indian Finch.
Amadina malabarica, *Linn.*	The Malabar Finch.
Amadina malacca, *Linn.*	The Malacca Finch.

Amadina striatus? *Linn.*	The striated Finch.
Amadina pectoralis? *Jerdon.*	The Newera-Ellia Finch.
Passer Indicus, *Jard & Selby.*	The Indian Sparrow.

c. EMBERIZINÆ.

Emberiza? *Scop.*	Bunting.

d. ALAUDINÆ.

Alauda Malabarica, *Scop.*	The Indian Lark.
* Alauda gulgula? *Scop.*	The crested Lark.
Pyrrhulauda grisea, *Scop.*	The Indian Pyrrhulauda.

e. LOXINÆ.

Loxia? *Sp.*	Crossbill.

FAM: BUCEROTIDÆ.

a. BUCEROTINÆ.

Buceros gingalensis, *Shaw.*	The small Hornbill.
Buceros violaceus, *Wagler.* apud *Blyth.*	The large Hornbill. vulg: Toucan.
Buceros pica *Scop.*?	The black & white Hornbill.

ORDER. SCANSORES.

FAM: PSITTACIDÆ.

a. PSITTACINÆ.

Loriculus Asiaticus, *Edwards.*	The small Ceylon Parakeet.

b. PEZOPORINÆ.

Palæornis Alexandri, *Linn.*	The Alexandrine Parakeet.
Palæornis torquatus, *Briss.*	The rose collared Parakeet.
Palæornis cyanocephalus, *Gmel.*	The ashy headed Parakeet.
Palæornis Calthropæ, *Layard.*	Layard's purple headed Parakeet.

FAM: PICIDÆ.

a. CAPITONINÆ.

Megalaima Philippensis, *Briss.*	The large redheaded Barbet.
Megalaima Zeylanica, apud *Blyth.*	The large Barbet.
Megalaima flavifrons, *Cuvs.*	The yellow headed Barbet.
Megalaima rubricapilla, *Gmel.*	The small redheaded Barbet.

b. PICINÆ.

* Picus gymnopthalmos, *Blyth.*	Layard's Wood-pecker.
Picus Macei, *Vieill.*	Small spotted Wood-pecker.

c. GECININÆ.

Gecinus chlorophanes, *Blyth.*	The green red headed Wood-pecker
Brachypternus aurantius, *Blyth.*	The orange coloured Wood-pecker.
Brachypternus Ceylonus, *Forster.*	Ceylon Wood-pecker.
* Brachypternus rubescens, *Vieill.*	The reddish Wood-pecker.

d. COLAPTINÆ.

* Micropternus gularis, *Blyth.*	Ground Woodpecker.

FAM. CUCULIDÆ.

a. COCCYZINÆ.

Centropus Philippensis, *Cuv.*	The Philippine Ground Cuckoo.
* Centropus chlororhynchos, *Blyth.*	The Yellow-billed Cuckow.

b. CUCULINÆ.

Oxylophus serratus, *Sparsm.*	The Crested Black Cuckow.
Oxylophus Corromandus, *Linn.*	The Collared Crested do.

Endynamys Orientalis, *Linn.*	The Eastern Black Cuckow.
Cuculus micropterus, *Gould.*	The Ashy Mountain Cuckow.
* Cuculus tenuirostris, *Blyth.*	The narrow billed Cuckow.
Cuculus Sonnerattii, *Lath.*	Sonnerat's Cuckow.

C. CROTOPHAGINÆ.

Phœnicophaus pyrrhocephalus, *Forster.*	The Malkoha.
Zanclostomus viridirostris, *Jerd.*	The Green-billed Malkoha.

ORDER. COLUMBÆ.

FAM. COLUMBIDÆ.

a. TRERONINÆ.

Treron bicincta, *Blyth.*	The Parrot Pigeon.
Treron Malabarica, *Jerdon.*	The Common Green Pigeon.
* Treron chlorogaster, *Blyth.*	The Large Green Pigeon.

b. COLUMBINÆ.

Carpophaga sylvatica, *Tickel.*	The Wood Pigeon.
Carpophaga *(Palumbus)* Torringtonii, *Kelaart.* C. ELPHINSTONEI, var, apud Blyth.	Lady Torrington's Pigeon.
Columba intermedia *Strickland.*	The Indian Rock Pigeon.
Turtur risorius, *Selby.*	The Collared Turtle Dove.
Turtur Suratensis, *Gmel.*	The Speckled Turtle Dove.
* Turtur humilis, *Temm.*	The Dwarf Turtle Dove.

c. GOURINÆ.

Chalcophaps Indica, *Linn.*	The Ground Pigeon.

ORDER. GALLINÆ.

FAM. PHASIANIDÆ.

a. PAVONINÆ.

Pavo cristatus, *Linn.*	The Peacock.

b. GALLINÆ.

Gallus Lafeyettei, *Lesson,* G. *Stanleyi, Gray, female, apud Blyth*	The Ceylon Jungle Fowl.

FAM. TETRAONIDÆ.

a. PERDICINÆ.

Gallo-perdix bicalcaratus, *Linn.* apud *Blyth.*	The Double Spurred Partridge of Ceylon.
Francolinus Ponticerrinus, *Gmel.*	The Pondicherry Partridge.
Coturnix Coromandelica, *Gmel.*	The Indian Quail.
Coturnix, sp.	A smaller Quail.

ORDER. GRALLÆ.

FAM. CHARADRIDÆ.

a. ÆDICNENINÆ.

Esacus recurvirostris, *Cuv.*	The Curved-bill Bustard.

b. CURSORINÆ.

Cursorius coromandelicus, *Gmel.*	The Coromandel Courser.

c. GLAREOLINÆ.

Glareola Orientalis, *Leach.*	The Indian Pratincole.

d. CHARADRINÆ.

Charadrius virginicus, *Bresht.*	The Marbled Plover.
Lobivanellus Goensis, *Strickland.*	The Goa Sand Piper.
Hiaticula Philippensis, *Latham.*	Small Plover.
Hiaticula Leschenaultei, *Lesson.*	Do.

e. CINCLINÆ.

Cinclus interpres, *Linn.*	The Turnstone.

FAM. ARDEIDÆ.

a. ARDEINÆ.

Ardea cinerea, *Linn.*	The Common Heron.
Ardea purpurea, *Linn.*	The Purple Heron.
Ardeola leucoptera, *Bodd.*	The Paddy-field Heron.
Ardeola bubulcus, *Savig.*	The Caboga Heron.
Herodias alba, *Linn.*	The Great White Heron.
Ardetta cinnamomea, *Gmel.*	The Cinnamon Heron.
Ardetta thalassina? *Swains.*	
Platalea leucorodia, *Linn.*	The White Spoon-bill,

b. CICONINÆ.

Leptoptilus argala, *Lath.*	The Adjutant.
Ciconia leucocephala, *Temm.*	The large Stork.
Dromas ardeola, *Payk.*	The smaller Stork.
Anastomus, sp.	The Anastomus.

c. TANTALINÆ.

Tantalus leucocephalus, *Forster.*	The White-headed Ibis.

Geronticus melanocephalus, *Lath.*	The Black-headed Ibis.
Ibis Falcinellus, *Linn.*	The Glossy Ibis.

FAM. SCOLOPACIDÆ.

a. LIMOSNIÆ.

Numenius phœops, *Lath.*	The Whimbrel.
Numenius arquatus, *Lath.*	The Curlew.

b. TOTANINÆ

Totanus ochropus, *Linn.*	The Green Shank.
Totanus hypoleucus, *Linn,*	The common Long Shank.
Totanus glottoides, *Vigors.*	The Indian Green Shank.

c. TRINGINÆ.

Tringa minuta? *Temm.*	The dwarf Sand-piper.
Limicola platyrhinca, *Temm.*	The Broad-billed Limicola.

d. RECURVIROSTRINÆ.

Himantopus candidus, *Bonn.*	The long-legged Avocet.

e. SCOLAPACINÆ.

Rhynchœa Benghalensis, *Gmel.*	The painted Snipe.
* Scolopax rusticola? *Linn.*	The Wood-cock
Gallinago stenura, *Temm.*	Horsfield's Indian Snipe.
* Gallinago scolopacinus, *Bonaparte.*	The Common Snipe.
* Gallinago gallinula, *Linn.*	The Jack Snipe.

FAM. PALMEDEIDÆ.

PARRINÆ,

Hydrophasianus Sinensis, *Wagler.*	The Screamer, or Jacana.

FAM. RALLIDÆ.

a. RALLINÆ.

Ortygometra rubiginosa, *Temm.*	The red or brown Rail.
* Corethrura Zeylanica, *Brown.*	The Ceylon Rail.

b. GALLINULINÆ.

Gallinula Phœnicura, *Pennant*	The red-tailed Gallinule.
Gallinula cristata, *Lath.*	The crested Gallinule.

N. B.—We have only sportsmens' authority for the Species of Snipes marked with an asterisk.

ORDER ANSERES.

FAM. ANATIDÆ.

a. PHŒNICOPTERINÆ.

Phœnicopterus ruber, ? *Linn.*	The Flamingo.

b. PLECTROPTERINÆ.

Sarkidiornis Regia, *Eyton.*	The Royal Duck.

c. ANSERINÆ.

Nettapus Coromandelianus, *Gmel* ?	The Coromandel Teal.

d. ANATINÆ.

Mareca Penelope, *Linn* ?	The Widgeon.
Anas pœciloryhnca, *Lath.*	The spotted Duck.
Deudrocygna arcuata, *Swains.*	The whistling Duck.
Dafila acuta ? *Bonap.*	The pin-tailed Duck.
Querquedula crecca, *Steph.*	The common Teal.

FAM. COLYMBIDÆ.

PODICEPINÆ.

* Podiceps minor, *Latham*.	The little Grebe.

FAM. LARIDÆ.

a. LARINÆ.

Xema bruneicephalus, *Jerdon*.	The Indian-hooded Gull.

b. STERNINÆ.

Sylochelidon Caspia, *Pall.*	The Caspian Tern.
Sylochelidon seena, apud *Layard*.	The orange-billed Tern.
Gelichelidon Anglica, *Brown*.	The gull-billed Tern.
Sterna melanogaster, *Temm*.	The black-bellied Tern.

FAM. PELICANIDÆ.

a. PLOTINÆ.

Plotus melanogaster, *Gmel*	The black-bellied Darter.

b. PELECANINÆ.

Pelecanus Philippensis, *Gmel.*	The Indian Pelican.

☞ *Species marked * are added from Mr. Blyth's Notes.*

PART III.

CEYLON REPTILES.

CEYLON REPTILES.

To induce the Ceylon Student of Zoology to investigate the characters of the Reptiles described in this part of the work, we have added the excellent description of Families and Genera from Mr. Gray's catalogue of specimens in the British Museum. Our descriptions of species are nearly all taken from living specimens.

The Ophidian Reptiles, of which there are about 30 species in the Island, could not be included in the descriptive account, as we have not been able, from the want of Books, to identify more than a few species. Among those found are, Python molurus, *Gray*, *(Rock snake or Indian Boa, Vulg.)*, Dendrophis picta, *Schleg.* Dendrophis ornatus, *Schleg.* Dipsas multimaculata, *Schleg.* Coluber Naja, *Linn.* *(Cobra de Capello)*. Bungarus candidus, *Linn.* Cerberus cinereus, *Gray.* Tropidophis schistozus, *Gray.* Cylindrophis maculata, *Wagler.* Cereaspis carinatus, *Wagler.* Daboia elegans, *Gray*, *(Tic-Polonga)*. Trigonocephalus Hypnale, *Wagler*, *(Caravilla. Sing.)* Trimesurus viridis, *Lacep.* *(Whip snake)*. Trimesurus Ceylonensis, *Gray.* Megæra Trigonocephalus, *Wagler.*

GRAY'S SYNOPSIS OF REPTILES.

CLASS. REPTILIA.

Animal furnished with a distinct bony skeleton. The skin clothed with horny imbedded plates or imbricated scales, which are covered with a thin and often deciduous epidermis. They respire by cellular lungs. The heart has a single ventricle divided into two or more cells, giving origin to two arteries and receiving the cold red blood by two veins from two auricles. Penis distinct. Oviparous, but the egg sometimes hatched in the body of the mother, often covered with a thick more or less calcareous shell. The young like the parent, and not undergoing any transformation.

SECT. I. SQUAMATA—SCALY REPTILES.

Body covered with overlapping scales. Skull formed of separate bones; the ear-bone external and only articulated to the rest. Vent a cross slit. The generative organs bifid. Tongue free.

1. LIZARDS. (SAURA.) Mouth not dilatable; lower jaw-bones united by a bony suture in front. Limbs 4, distinct, rarely in such a rudimentary state as to be hidden under the skin.

2. SERPENTS. (OPHIDIA). Mouth very dilatable; bones of the lower jaws separate from each other, only united by ligaments. Limbs none, or only in the form of short spurs on the sides of the vent.

SECT. II. CATAPHRACTA—SHIELDED REPTILES.

Body covered with square imbedded shields. Bones of the skull adglutinated together, hard, with the ear-bone sunk into its substance. Jaws united into a solid mass; mouth not dilatable. Vent roundish or linear, plaited. The generative organs simple.

3. TORTOISES. (CHELONIANS). Body short, depressed. The bones of the thorax external, surrounding the muscles of the body like a case, out of which the head, limbs and tail are protruded. Jaws toothless, covered with a horny coat.

4. EMYDOSAURIANS. Bony fusiform, covered with square bony plates placed in longitudinal lines. Limbs 4, free, Vent linear, longitudinal. Jaws with teeth.

5. AMPHISBENIANS. Body elongate, cylindrical, covered with square imbedded plates, placed in cross rows. Limbs none or very short, weak. Vent transverse, plaited. Jaws with teeth.

CEYLON REPTILES.

SQUAMATA. SCALY REPTILES.

Body covered with overlapping or granular scales. Skull formed of separate bones. The ear-bone external, and only articulated to the skull. Tongue free, elongate, nicked at the tip, often extensile. The lungs free in the cavity of the thorax. Vent a linear cross slit. The male organ and vagina forked. Oviparous; the eggs when deposited covered with a more or less coriaceous shell.

ORDER I. SAURA—(*LIZARDS.*)

Mouth not dilatable, jaws toothed, the lower jaw bones being united by a bony suture in front. Eye generally with distinct eyelids. Drum of the ear generally distinct; exposed. Limbs 4, distinct, rarely in such a rudimentary state as to be hidden under the skin. Toes clawed. Body elongate, rounded, covered with imbricated or granular scales. Ribs distinct, mobile, and with a distinct sternum. Tail elongate, tapering, rarely pre-hensile, generally covered with whorls of scales. Egg with hard skin. The young not undergoing any metamorphosis.

SUB-ORDER. LEPTOGLOSSÆ.

Slender Tongued Lizards.

TRIBE. CYCLOSAURA.

Scales of the belly square (very rarely rhombic, keeled), in cross bands; of the back and tail rhombic, imbricate, or circular and sub-granular, placed in cross rings; of the sides generally granular, rarely like the back. Tongue elongate, flattened, base sometimes sheathed, generally free, only attached to the gullet by a long frænum, and with two elongate cylindrical, horny tips. Tail elongate, with whorls of scales, generally conical, tapering, sometimes compressed, with two elevated crests above.

FAM. MONOTORIDÆ. (*Monitors.*)

Head with minute polygonal shields. Teeth adnate to the inner side of the jaws. Tongue elongate, slender, retractile into a sheath at its base. Scales small, roundish, placed in cross rings; those of the sides like those of the back. Legs 4, strong. Toes 5-5 compressed, unequal. Thighs poreless. Super-orbital plate bony. Old world, near water,

a. *Scales over the eyes equal. Nape coloured like the back.*

GENUS. MONITOR. *Gray.*

POLYDÆDALUS. *Wagler.* UARANUS. *Fitz.*

Nostrils small, round, in the middle between the apex of the muzzle and the front angle af the eye; tail elongate, compressed with a double-edged keel above; toes elongate, unequal, strong, teeth rounded.

MONITOR DRACÆNA, *Gray.*

The Indian Monitor. Talla-Goya—*Sing.*

Syn. Lacerta Dracæna—*Linn.*
Stellio Salveguardia—*Laur.*
Tupinambis Bengalensis—*Daud.*
T. Indicus—*Daud.*
Uaranus guttatus, } *Merrem.*
——— punctatus, } *Merrem.*
——— Argus, } *Merrem.*
Monitor gemmatus—*Guerin.*
Indian Iguana—*Vulg.*

Brown, black spotted above. Scales of the head, small, subequal; Scales of the neck, body and limbs oval, flat, with a central spot in most, surrounded with a granular ring. Scales of the tail foursided, keeled, and also with a granular margin. Lower parts paler, or whitish in middle aged with purplish streak. Scales foursided, with a granular rim. A fold of skin on sides of belly. Toes unequal, spotted yellow, of hind feet longer. Claws acute, long. *Irides* golden.

A large sized one measured—

	ft.	in.
Head	„	3½
Body	1	5
Tail	2	8
Total length	4	4½

Anterior limbs 7 inches. Posterior limbs 10 inches.

Geographical Distribution.—India, Ceylon.

This monitor, (or as it is better known in Ceylon, the *Goana*) is found in great abundance in all the maritime provinces, rarely in the higher Kandian districts. The natives are partial to its flesh; we have once tasted some excellent soup made from a tender Goana, it tasted not unlike hare soup.

The Monitors live in holes, and in mid-day they steal out of their cells in search of food, which consists of smaller reptiles and insects. Ant-hills furnish them with a dainty repast. At Trincomalie they are hunted down by dogs, and sold in the market for 6 pence each.

The young of this species is very unlike the adult individual, and may be mistaken for another species. One measuring 8½ inches long, with tail, had the following characters.

Light brown above, with longitudinal series of pale yellow eyed black spots, and the interspaces between the spots, also pale yellow, forming nearly squares, which give a net work appearance to the back. Head brown, indistinctly spotted white; a narrow black streak runs on the sides of the neck from the posterior angle of the eye to shoulder. Beneath silvery white, with narrow transverse blackish bands; chin banded. Tail angular, posterior half of tail black, with a broad light brown band; the other half of the tail ringed and spotted with black.

Nothing almost could exceed the delicacy of the silvery scales on the lower parts, and the beautiful enamalled appearance of the back. The spots gradually disappear as the animal grows to maturity; the black streak on the neck is lost in about the middle aged.

B. *Scales over the eye with a larger Central series.*

GENUS. HYDROSAURUS, *Wagler.*

Nostrils oblong, longitudinal, near the apex of the muzzle; tail elongated, with a double edged keel above; toes unequal, elongate; teeth compressed, sharp edged denticulated; scales small.

HYDROSAURUS SALVATOR, *Wagler.*

The Streaked Lace Lizard. Cabara-Goya—*Sing.*

Syn. Hydrosaurus bivittatus—*Wagler.*
Uaranus vittatus,—*Lesson.*
Monitor elegans—*Gray.*
M. marmoratus—*Weigmann.*
Tupinambis bivittatus—*Kahl.*

Above dark olive brown, nearly black. Beneath yellow, blackish dentilations in some. Four or five irregular transverse yellow bands on the back, composed of small interrupted circles (or parts of circles) of yellow spots. Head brown above; eyelids spotted yellow. Lips, cheeks and lateral parts of neck yellowish, chin and throat with blackish transverse bands, the posterior ones slightly undulating; a few yellow spots on the upper part of neck. Limbs spotted yellow. Toes long, unequal; claws blackish. Tail wfth a double edged upper keel, speckled yellow throughout, and interrupted yellow streaks on the thicker or basal portion. *Irides* yellow.

Scales of the head irregular, unequal, smooth; a set of larger scales in the upper part of brow. Scales on the body, oval, keeled, and each surrounded with a granular ring. Scales on the upper parts of limbs and part of tail strongly keeled. Scales of the neck and shoulders almost conical. Those of the under parts of the body and tail, large, flat four sided. A fold of skin on the sides of abdomen.

Nostrils near the muzzle, large, oblique, nearly longitudinal in the young and in preserved specimens.

The only specimen examined, when describing species for this work, had not the teeth dentilated, but they were long, compressed and sharpedged, it was a very old individual and measured—

	ft.	in.
Head....................	„	4½
Body....................	2	4
Tail	3	8
Total length......	6	4½

Anterior limbs 9 inches long. Posterior limbs 13 inches long. Circumference of the middle of the body 2 feet 8 inches, of basal portion of tail 13 inches.

Geographical Distribution.—India, Malayan Peninsula, Pinang, South Africa, Philippine and Molucca Islands, Amboina. Ceylon.

The only doubt we have of the identification of this monitor with *Hydrosaurus*, is in the absence of dentilations in the teeth. We have not been able to procure a middle aged individual. A very young specimen was lately caught in the neighbourhood of Trincomalie, which measured head and body 6½ inches, tail 9½ inches. Dr. Cantor, to whom we sent the specimen preserved in spirits, is inclined to consider it the young of a distinct species, but we are all but sure of its being the young of the species above described; the following is a description taken of it when alive.

General colour of upper surface black with an olive shade. Beneath yellow with blackish dentilations or projections from the sides. Head with pale yellow spots. Upper part of neck spotted with brighter yellow; a black streak from the posterior angle of the eye to the shoulder. Cheeks and lower surface of neck transversely banded with black. Upper part of body with five transverse rows of yellow circular spots, with a palish centre on each spot. Between these ringed bands transverse rows of smaller and paler full yellow spots. Tail banded black alternately with yellow; five or six of the anterior black bands have on each a single row of very minute yellow spots; and in the inferior a large central yellow spot diffused. Broad black pointed projections transversely on the belly from the sides. Superior surface of limbs black with cross rows of yellow spots; and black dentilations on the inferior or inner yellow surface. Toes black, yellow spotted.

The *Cabara-goya* is found in most parts of the lowlands and also in some of the highland districts, near marshes and rivers. When pursued on land, they take refuge in the nearest water. *

TRIBE. GEISSOSAURA.

Scales of the belly and (almost always) of the back and sides rounded, quincuncial, imbricate, formed of a more or less thick, vascular bony plate, covered with a thin epidermis, often showing the vessels through it. Sides rounded, covered with scales like those of the back. Tongue narrow, short, flat, slightly nicked at the end. Head covered with regular many sided shields (rather scale-like *Lialisidæ*); neck not contracted. Body fusiform or sub-cylindrical. Preanal pores none, (except in *Pygopus* and *Lialis*)

FAM. SCINCIDÆ.

The Scincs.

Head sub-quadrangular, regularly shielded. Rostral plate moderate, erect, sometimes rather produced and transversely keeled. Nostrils lateral in a more or less large nasal shield, with sometimes a supra-nasal over it, between the nasal and internasal. Body fusiform or sub-cylindrical. Tail cylindrical or tapering. Scales smooth, or keeled, or striated. Limbs 4, more or less strong, sometimes wanting, or rather hidden under the skin. Femoral pores none.

GENUS. RIOPA, *Gray.*

EUMECES, *B. Weigmann.*

EUMECES, part, *Dum et Bib.*

Head pyramidical. Muzzle rounded in front. Rostral erect. Frontoparietal shields double, interparietal distinct. Nostrils lateral, near the hinder edge of the nasal plate; supra-nasals 2, contiguous. The lower eyelid with a transparent disk. Palate not toothed, with a triangular notch behind. Ears small circular, drum sunken. Body elongate, cylindrical. Scales smooth. Limbs very short, weak. Toes 5-5, short, unequal, with a series of compressed tubercles beneath; palm and soles equally granular. Tail elongate, cylindrical.

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* Since writing the above we have secured a female individual, in which the serratures on the edges of teeth are visible. So that, we have every reason to be satisfied with the correctness of this identification.

RIOPA PUNCTATA, *Gray*, var.

The Dotted Rock Scinc.

Syn. Lacerta punctata, *Linn.*
Lacerta interpunctata, *Gmelin*
Seps scincoides, *Cuv.*
Lygosoma punctata, *Griffith.*
Scincus bilineatus, *Daud.*
Le Double Raie, *Lacep.*

Above fulvous olive brown. Beneath silvery white. Back with 6 longitudinal rows of black dots, which coalesce and form only 4 rows in the neck. Two pale narrow streaks on sides from the head to the tail; below the pale streaks there are six lines of lighter black dots, the three inferior ones being more indistinct. Head, cheeks, legs and toes minutely dotted with black. Tail reddish, black dotted on the upper surface, and with pale spots beneath. Eyes central, with 4 equal supra-orbital plates. Toes small, unequal; soles and toes granular. Ears circular. Tympanum sunken.

Head and body......	2. 5-10 inch
Tail	2. 3-10 „
Total length......	4. 8-10 inches.

Geographical Distribution.—India, Ceylon.

This variety of *Riopa punctata* we obtained at Trincomalie, where it is very rare; other varieties are found in the Western and Central provinces. They are known in the Island as the small Brahmin lizard.

GENUS. TILIQUA, *Gray*.

EUPREPES, part. *Wagler*, *Dum* et *Bib*.

Head squarish. Nasal plates small, oblong, lateral. Nostril rather large, sub-central or posterior fronto-nasal distinct, triangular contiguous in front; fronto-parietal shields 2, contiguous; interparietal triangular. Lower eyelid with a central longitudinal band of 4 or 5 square scales. Ears moderate, open, lobed in front. Fusiform, stout. Scales 3 or 5 keeled. Limbs 4, stout, rather far apart. Toes 5-5. Palms slightly granular. Scales under the toes smooth. Tail round tapering, with 3 or 5 series of rather wider scales beneath.

TILIQUA RUFESCENS, *Gray*.

The Indian Tiliqua, or Brahmin Lizard.

Syn. Tiliqua carinata, *Gray*.
Tiliqua affinis (young), *Gray*.
Lacerta rufescens, *Shaw*, *Cuv*.
Scincus multifasciatus, *Kahl*.
Euprepes Sebæ, *Dum et. Bib*.

Above olive brown, bronzed. Beneath sulphurous yellow or whitish. Scales in the back 3 keeled. A silvery white streak from the upper part of orbit to root of tail, below this white streak a reddish brown broad one; some of the scales dotted white and the still lower parts of sides sprinkled red. Head olive green, margin of scales black. Chin and lips white. Tail with large scales; for three fourth of its length of a reddish colour. Black irregular spots on the limbs, and in some specimens four or five zig-zig black lines on the back. Pteregoid teeth few, indistinct, felt under the palatal membrane. Ears with minute lobules in front. Limbs stout, feet rather large.

A large one measured.

Head	0. 5-8	inch
Body	3. 2-8	„
Tail	3. 4-8	„
Total length	7. 3-8	inches.

Some are larger.

Geographical Distribution.—Sandwich Islands, Philippines, Timor, Celebes, Borneo, Java, India, Ceylon.

Several varieties of this *Scinc* are found in various parts of the Island. The above described variety is common at Trincomalie. In the variety found about Colombo, the red spots are not seen on the sides. Some of the Badulla specimens have bluish spots on the sides, The *Tiliqua* is generally known as the Brahmin Lizard (*Poechee-Bramina*, Portg.); it frequents the hedges and walls of gardens. In the Kandian provinces they are generally seen on rocks. They feed on insects; their movements are very rapid.

FAM: TYPHLOPSIDÆ.

Typhlops.

Head depressed, broad, rounded in front, with a large oblong erect nostral pate. Nostrils lateral, in a distinct nasal shield behind the edge of the muzzle, and with a slit to the hinder lower and sometimes to the front upper edge of the plate. Mouth small, lunate, inferior, above edged by the shields on the side of the head, upper labial shields none. Crown covered with 3 series of 6 sided scale-like shields, the middle ones representing the internasal, frontal and interparietal shields. Eyes lateral, covered by and only to be seen through the ocular shields, sometimes wanting. Tongue elongated, flat, forked at the tip. Body cylindrical suddenly contracted and obliquely convex and scaly above at the end, tip covered with a conical or spinous shield.

They move with considerable swiftness, sometimes found three or four feet under ground, where they bury themselves in the rainy season, they are also found under stones. They are quite innocent, and not inclined to bite; they live some time after they are immersed in spirits of wine.

GENUS. ARGYROPHIS,—*Gray*.

Stenostoma, part. *Fitz.*

Typhlops, part, Wagler.

Rostral oblong erect, regularly arched in front and slightly convex above and below, narrow below. Nostrils inferior, with a slit extending to the upper as well as the lower edge of the nasal. Nasal, fronto-nasal and eye shields flat, oblong, subangular, well developed. Eyes distinct. Crown with 3 series of 6 sided shields. Body subcylindrical. Scales smooth, equal sized. Pre-anal scales many, like the others. Tail very short, suddenly tapering, convex above, tip acute, conical incurved.

ARGYROPHIS BRAMICUS,—*Gray.*

The Crenulated Silver Snake. Dapat Naya.—*Sing.*

Black or greyish black, rather paler beneath; head regularly rounded and pale in front; nostral and nasal shields with a pale crenulated submarginal edge, nostral oblong, scarcely one fourth the width of the head, rounded above, contracted beneath; the crown shields equal, rather broad, rounded behind; the fourth shield rather wider, the fifth longer than the other three, *Gray.*

Geographical Distribution. Canton Provinces, Manilla, Java, India, Ceylon.

As we have not a specimen of this Silver Snake to describe from, we have given above Mr. Gray's description of the species, which has long been known to exist in Ceylon in paddy fields and other marshy grounds where it is mistaken for earth worms.

Dr. Cantor gives the following description of the species.

Shining copper coloured, or brown of various shades above, paler beneath. Some individuals of a uniformly bluish white. All the scales with a dark brown spot at the anterior-part. The shields of the head have a whitish line close to their margins. In the young the latter is crenulated, and the sides of the head, lips, throat, the anal region, and the point of the tail are yellowish or whitish, and the body is semi-transparent.

Length of the head	3/8 inch.
do. of trunk	7 2/3 „
do. of tail	1/8 „

Total length ......7. 6-8 inches.

Circumference of the neck 1/2 inch; of the tail 5/8 inch.

FAM: UROPELTIDÆ.

Rough Tails.

Head conical compressed, shelving and acute in front, flat above and behind. Crown covered with regular shields. Rostral produced, moderate convex, horny subtriangular, erect produced and acute behind. Nostrils roundish, lateral simple, in the middle of the front of an erect subtriangular band-like nasal. Internasal none, fronto-nasal subtriangular, truncated below, contiguous above, frontal and fronto-parietal distinct. Nape scaly. Labial shields 4-4, distinct. Eyes distinct, lateral, in the middle of the front of an erect eye-shield, and covered by the shield without any eyelids. Eyebrow shields none. Tongue, elongate, flat, forked at the tip. Body cylindrical, obliquely truncated above.

This family is intermediate between the lizards and snakes; following Cuvier and others, I was induced to refer it to the latter order, and therefore did not insert it in the synopsis of the families; but on re-examination, and comparison with the various modifications presented by the genera of Typhlopsidæ, I have been induced to place it in this order. Cuvier seems to have been in doubt, for though he placed the genus with the snakes, he also regarded the species as a section of ths Typhlopsidæ. Schlegel names the group Pseudo-Typhlops.—*Gray*.

GENUS. UROPELTIS.

Tail obliquely truncated, flattish and coverd with a flat roundish radiating granular shield, lower edge rounded, the under side of the tail with 6 series of small scales.

UROPELTIS Sp. (?)

Above dark brown, beneath paler. Scales with pale whitish margin, giving a reticulated appearance throughout. Head yellowish in some. Rostral yellow. Tail truncated, thick, convex, shelving superiorly granular. Vent shields three,—2—1; a yellow spot anterior to the vent shields.

Length from 1 to 2 feet.

The young is of a dark olive colour.

Geographical Distribution. Ceylon.

This rough tail has not we believe been described; and it does not appear to us quite clear that it belongs to any of the three genera of Uropeltidæ described by Mr. Gray in his Catalogue. As Dr. Andrew Smith has specimens of it he may yet form a new genus for this species. It is found in great abundance in Trincomalie, generally within hillocks of sand in open plains. We have also received specimens from the Kandian provinces.

GENUS. SILUBOURA.—*Gray.*

Uropeltis, part, *Cuv.* Typhlops, part, *Schn.*

Tail obliquely truncated, upper part of end rather convex, covered with 2 keeled scales, the lower edge acute, with depressed sharp edged 2 tubercled scales, lower surface with 3 series of broad larger scales. Vent shields one before and 2 behind.

SILUBOURA CEYLONICUS,—*Gray.*

The Ceylon Rough Tail.

Syn. Uropeltis Ceylonicus, *Cuv. Cocteau.*

Brown, minutely and indistinctly yellow spotted, with a yellow band in front of the vent, continued in a band on each side of the tail. (*Gray.*)

Geographical Distribution. India, Ceylon.

Not having a specimen to describe from, we have substituted the above description from Mr. Grays' Catalogue. Specimens are in the Army Medical Officers' Museum, Colombo.

SUBORDER II. PACHYGLOSSÆ.

Thick-tongued Lizards.

TRIBE. NYCTISAURA.

Scales of the belly small, rhombic imbricated, of the head, back and sides granular. Tongue thick, short, convex, slightly nicked at the end. Eyes nocturnal. Eyelids circular, not connivent. Pupil linear, rarely round, erect. Body depressed, sometimes fringed on the sides. Feet for walking. Toes subequal, lamellar beneath, and generally dilated.

FAM. GECKOTIDÆ.

The Geckoes.

The only family of the tribe.

They live on insects and worms, which they swallow whole, the œsophagus being very large. They produce a sound by the movement of their tongue against their palate, which has given rise to their name, similar to the double click often used in riding, which has been attempted to be imitated by the word Gecko, Fockaie and Geitge and also led to their being called postilions, claquers and spitters. Nocturnal, avoiding the heat of the sun, and catch their food in cracks in rocks, houses, &c. Their movements are very brusque, without sound, and exceedingly rapid. They hybernate, and are provided with one or two fatty masses in front of the pubis, which are said to be a provision for their nourishment during that period. The males are smaller, and often have femoral pores, which are wanting in the female. The egg is spherical with a hard calcareous shell.—*Gray.*

GENUS. HEMIDACTYLUS.—*Cuv.*

Toes free, pear shaped, dilated towards the end, with two series of diverging scales beneath; the last joint compressed, free, exserted, clawed; thumb elongated, like the toes clawed. Back granular, generally with cylindrical series of large tubercles. Body with a very slight ridge upon the lower part of the side. Tail rather depressed, hexangular above, with cross rings of spines, convex beneath, rounded on the side beneath. The chin scales are very variable in specimens of the same species.

a. *Tubercles of back large, keeled.*

HEMIDACTYLUS TRIHEDRUS, *Lesson.*

Above, pale olive brown. Beneath whitish: A dark brown streak from the nostril to the eye, and in a line with this there is a brown streak on the temple, which is also bordered above and below with white tubercles. Upper surface of head immaculate, covered with minute granular and small three sided tubercles. Neck, back and upper surface of tail with dark brown transverse bands, some of which are transitorily white spotted,—these white spots are confined to the keeled tubercles. Back and neck covered with large triangular keeled tubercles. Outside of limbs studded with small and large three tubercles,—a few of which become white at times. The limbs also are occasionally maculated with dark brown transverse bands. Tail banded above with brown half rings of sharp pointed, keeled tubercles, or spines. Beneath rounded, and covered with large six sided scutæ. Ears large, oblique. Irides golden brown; pupils vertical. Chin shields 9 central, large, pentagonal; the lateral ones smaller. Pre-anal pores 8. 8, or 8. 7. Toes moderate.

A large male measured.

Head	9-10 inch.
Body	2
Tail	3
Total length	5. 9-10 inches.

Females larger by 2-10. or 3-10. inch only.

Geographical Distribution, South of Europe, India, Ceylon.

Rare in Ceylon. The few specimens we obtained at Trincomalie were found in Ant-hills. This species is easily distinguished from others found in the Island, from its large size, pale olive-brown colour, often presenting pure opaque white spots. In spirits the transverse bands and white spots become nearly obsolete. We have never seen this Gecko in houses or on trees. It lays from three to six eggs very little larger than those of the house Gecko, *Hemidactylus frenatus.*

HEMIDACTYLUS MACULATUS.? *Dum.* et *Bib.*

The spotted Hemidactyle.
Syn: Hæmidactylus Sykesii,—Gray.

Colour variable; generally of a greyish brown on the back; upper parts of head and tail with longitudinal series of rusty brown spots; out side of limbs also spotted rusty. Beneath pale or yellowish white. Head, neck, back and outside of limbs granular, mixed with larger triangular keeled scales, the latter on the back running in longitudinal series,—granules in alternate order. Tail rounded, with a longitudinal groove on the upper surface, and six series of divergent keeled spines. Under surface more rounded and covered with hexagonal scutæ. Pores—16—16 in males only. Thumb long, its claw also long. Size, a little larger than *H. frenatus.* An ordinary sized specimen measured:

Head and Body........................ 2 ¼ inch.
Tail 2

Total length......4 ¼ inches.

Geographical distribution. China, Bengal, Ceylon, (widely distributed).

This species is sometimes seen of a pale white colour, or brown with white spots. It is found in houses in all the Maritime provinces. In the Northern provinces, this Gecko is more abundant than *H. frenatus,*—the other common house Gecko. We have not received a single specimen of this species from higher parts than Kandy, where a larger species, closely allied to this, is also abundant, and which we shall name after a friend, to whom we are indebted for several Zoological specimens, and to whom was awarded one of the prizes of the Royal Industrial Exhibtion, for specimens of natural productions of Ceylon.

HEMIDACTYLUS PI[illegible]RESII. N. S.—*Nobis.*

The Kandian Gecko.

Pale grey, marbled with black, a black streak on the temples. Back with longitudinal series of rather large semiconical keeled tubercles, a few smaller tubercles on the head and outer-side of limbs. Tail flattened; upper surface with 6 series of sharply pointed keeled spines. Femoral pores in males only, in two almost continuous lines.—16—17,=32, or 34.

Head.. 9-10 inch.
Body..2. 2-10 „
Tail ....3. 6-10 „

Total length...6. 7-10 inches.

Geographical distribution. Ceylon.

This Gecko we believe is an undescribed species, although it has been by some identified with *H. Leschenaultii.* Its tolerably large, almost three sided, tubercles in regular longitudinal series, and the more numerous femoral pores clearly point out this species as distinct from *H. Leschenaultii* (apud Gray), which has only "small scattered conical tubercles in the middle of the back," and only 26 femoral pores, in 2 lines. We have not as yet seen a lizard in Ceylon which answers to the abovementioned characters of *H. Leschenaultii.* This new species *H. Pieresii* cannot be mistaken for *H. trihedrus,* from its colour and smaller tubercles. But, it is quite possible, that it is one of the new species Dr. Jerdon informs us he has discovered in Southern India. This naturalist also says that *H. Leschenaultii* of India has only 12 or 13 femoral pores, in which opinion Mr. Blyth agrees.

b. *Tubercles moderate, roundish.*

HEMIDACTYLUS COCTÆI. *Dum. et Bib.*

The tree Gecko.

Above ashy grey, silvery, marbled with black. Beneath white. Upper parts covered with minute granular tubercles. In some individuals, there are a *few* larger, roundish tubercles scatterred on the back and outside of limbs. Tail broad and flattened at the base with more or less deep longitudinal medial furrow on the upper surface which as in the other species is armed with series of divergent spines on half rings. The two central chin shields very large, pentagonal. Femoral pores 15 to 16=30 or=32, in two distinct lines, widely separated from each other. Thumb with a distinct claw.

The average size of males is as follows,

Head............................	0. 8-10 inch
Body............................	2. 8-10 „
Tail	3. 4-10 „
Total length	7. 2-10 inches.

Geographical Distribution.—India, Penang, Ceylon.

This Gecko is very variable in colour, sometimes it is entirely of a frosted silvery grey, with scarcely a trace of the black markings.

At other times, the black spots are very conspicuous, often by coalescing they give a blackish hue to the upper parts of the head, body and tail. It frequently casts off its cuticular covering. It lives for months in confinement apparently without food. Rarely seen in houses, more frequently on trees, in hollows of which they are found in the day time. The female is a little larger, it lays 5 to 6 eggs. The only parts of the Island from whence we have obtained specimens of this species are Batticaloa, Jaffna, Point Pedro; at Trincomalie, also, it is very abundant. There is one peculiar character which is occasionally observed in the Gecko, viz., the corrugation of the skin over the face so as to make a circular ridge with the orbits over the muzzle, which some specimens retain even in spirits. This feature leads us to think that the "edge of the orbit prominent and prolonged on the muzzle" of *H. Leschenaulttii* may be only a temporary character of that species too.

Dr. Cantor has separated *Boltalia sublævis,* of Gray's catalogue from *H. Coctæi,* the former species is said to have the thumb clawless, whereas *H. Coctæi* of Ceylon, as well as that from Penang, have clawed thumbs. Dr. Cantor, who has seen specimens of the Ceylon species, informs us that they are identical with the species found by him at Penang, only, that in all the individuals we have examined, the femoral pores of each side amount to 15 or 16, never less.

HEMIDACTYLUS FRENATUS, *Schlegel.*

The Cheecha, or the streaked Hemidactyle.

Syn. Hemidactylus lateralis. } *Gray.*
Hemidactylus quinquelineatus. }

Colour of back variable, generally pale grey or yellowish, often streaked with 5 or 6 longitudinal series of brown spots, more or less coalescing. Beneath whitish or yellowish. Back granular, with a few larger granules scattered on the sides. Tail rounded above, rather flattened beneath; upper surface armed with large divergent spines in six longitudinal series. Thumb short, claw very small.

Irides golden, pupils vertical. Femoral and pre-anal pores in a continuous line, from 13 to 14 on each side.

Average size,

Head and body	2. 4-10 inches.
Tail	2. 3-10 „
Total length	4 7. 10 „

Geographical Distribution.—Malayan Peninsula, Penang, Singapore, Amboyna, Timor, Java, Marianne Islands, Ceylon, India, South Africa, Madagascar.

This widely distributed species is found in all parts of the Island, except in the Newera-Ellia range, where it is replaced by a species of Goniodactylus? This Gecko is known in the Island as the *Cheecha*, the peculiar smirking noise it makes, does not however resemble the sound conveyed by this word, it is more similar to the double click made by horsemen, which when imitated, by the human voice, will induce the Gecko frequently to return the call.

The natives consider the clicking of the *cheecha* ominous of evil, and some are so foolish as to give up a journey, or refrain from quitting the house for any purpose at night, if the cheecha's voice is heard at the time. An amusing story is told of a Police Magistrate of Point Pedro, taking advantage of the superstitious notion of the Hindoos on this head, and applying it to the discovery of truth. The learned gentleman once surprised a native witness in the act of lying, by telling him that he would summon a Gecko to speak the truth on the matter, and forthwith he chirped like one of these saurians, and lo! the sound was repeated by a Gecko above the prisoner's head, (which of course the Magistrate did not see); the effect was magical, as the judge had the enviable reputation of being conversant not only with the language of birds, but also with that of lizards, the astounded witness from that moment spoke the truth, fearing the judge would detect (with the assistance of his friend the Gecko) any departure from the "truth and nothing but the truth."

The cheechas being, like others of the same family, nocturnal in their habits, are seen in all houses soon after sunset in search of prey, which consists of flies, cockroaches, &c. Children sometimes amuse themselves by feeding the cheechas with boiled rice fixed at the end of the midrib of a palm leaflet. The individual so gently treated will return night after night to the same spot on the wall, in expectation of its evening repast.

All the species we have described have the faculty of reproducing the tail when broken off by accident. Fear or the slightest touch will make some shake off their tails, with the view, as is supposed, of their escaping the spoiler. When the tail is reproduced (which is comparatively a quick process) the divergent spines are absent, and the scutæ below are seldom as distinctly developed as in the original member. This species, too, sheds the cuticular covering. The female lays her eggs from 3 to 4 in number, in crevices of old walls and in the hollows of trees. In the forests, this species is very frequently seen running up the trunks of trees, and also on rocks.

TRIBE. STOBILOSAURA.

Scales of the belly small, rhombic, imbricate, of the back and sides imbricate. Tongue thick, short, convex and slightly nicked. Eyes diurnal, with valvular eyelids. Pupils round. Feet for walking. Toes unequal. Tail with more or less distinct whorls of scales.

FAM. AGAMIDÆ.

The Agamas.

Teeth implanted on the edge of the jaws. Tongue short depressed, apex entire or slightly nicked. Eyelids connivent, valvular. Feet for walking. Toes all free, unequal, the thumb of the hind feet on the same plane as the other toes, the little toes lower down on the ankle than the thumb.

The thumb is anterior and internal, and the great toe of the hind feet occupies the same position, the thigh and foot being bent forwards.

GENUS. SITANA. *Cuv.*

SEMIOPHORUS, *Wagler* and *Weigm.*

Head pyramidical, quadrangular, short, covered with small nearly equal, keeled scales. Ear-drum, small round superficial. Tongue thick, fungous, entire. Throat without any cross fold in front or plaits upon the sides; the males with a large compressed throat pouch. Nape with a rudimentary crest. Body sub-quadrangular. Back rounded. Scales rhombic, keeled, imbricate generally equal; of the sides rather smaller. Tail long, conical, not keeled. Toes 5 in front, 4 behind; femoral pores, none.

SITANA PONTICEREANA, *Cuv.*

Above fulvous brown with two pale streaks on each side of back, the interspace occupied by 5 or 6 dark brown rhombic spots, having, in general, a central longitudinal streak in each, or sometimes spotted. Beneath white, lustrous at times. Sides speckled indistinctly with brown. Head spotted and barred with dark brown; a pale whitish streak runs along the upper lip. Limb also barred; a few rhombic spots on the anterior third of tail, the rest ringed. Throat pouch with a medial purplish streak which often becomes obsolete.

Length of head and body...... 2¼ inch.
Do. of Tail .... 4½ „

Total length...... 6¾ „ inches.

Females are smaller. No throat pouch.

Geographical Distribution.—India, Ceylon.

The *Sitana* has great facility of changing colour: when alarmed, the whole upper part of the body becomes of a dark brown, with scarcely a trace of spots or streaks, at other times the spots become invisible and the whole surface puts on a yellowish colour. The purple streak on throat pouch is also occasionally obliterated. This appendage is only inflated at times. No trace of nuchal crest in any of the numerous specimens we have examined. In a few there are scattered small tubercles on the occiput.

This lizard is very common in Trincomalie and the neighbouring parts; we have not seen it from any other district of the Island. It is generally found on the ground and on small trees and plants; its motion is very rapid, and when pursued it will take refuge in holes or among roots of grass, where the female lays her eggs. They feed on small insects and their larvæ.

The Draco (flying lizard) has not to our knowledge been seen in Ceylon, except as specimens brought from Southern India.

Ears hidden under the skin.

GENUS. CERATOPHORA, *Gray*.

Head quadrangular, with small rather convex scales. Eyebrows rather produced horizontally. Muzzle prolonged into a *conical horn-like process.* Nostril lateral, anterior. Throat with oblique series of slightly dilated rhombic shield-like scales on the sides, and two rows of smaller scales in the middle. Ear-drum, hidden under the skin. Occiput and temples rather tubercular. Nape with a crest of conical scales. Back slightly keeled. Scales of the back rhomboidal, unequal, placed in oblique bands; of the belly smaller, equal, smooth. Femoral pores none. Tail elongated, tapering, with 2 rows of narrow keeled scales beneath.

CERATOPHORA STODDARTII, *Gray*.

Stoddart's Ceratophora.

Dark green with transverse dark brown or blackish bands. Limbs and tail also banded, Lips, chin and lower parts white. Behind the ears some whitish or yellow streaks. The generic characters above given is sufficient to distinguish this lizard from all others in the Island. The largest specimen examined measured,

Head	$0 \frac{7}{8}$	inch.	
Body	$3. \frac{3}{8}$	„	
Tail	5	„	inches.
Total length	$9. \frac{1}{8}$	„	

Nasal process from 3-10 to 6-10 inch, narrow and sharp pointed.

Geographical Distribution.—Ceylon.

This lizard when alarmed changes its green colour into a dark brown. The nasal appendage and white throat and lips also become then of a purplish colour. In some individuals the sharp pointed corneous process is absent, and in its place a small white tubercle is seen. Before we transmitted to Dr. Smith several specimens from Newera-Ellia, there were only two in Museums in Europe,—one in the British Museum marked "from Ceylon" was presented by the late Colonel Stoddart, R. Staff C., and the other in the Leyden Museum, habitat not marked. From the scarcity of specimens, it was long thought doubtful, whether it was a native of Ceylon. It was, therefore, with great pleasure that we found on our return to Ceylon a specimen of it in the Army Medical Officers' Museum at Colombo, and subsequently living ones at Newera-Ellia, where it is the most numerous species. We have also received specimens from Hewahetta and Dimboola, but not from lower parts of the Island. We are, therefore, inclined to consider the *Ceratophora* as an inhabitant of only the alpine parts of the Island.

The *Ceratophora* is seen generally on old trees in search of larvæ, but we never could detect the animal applying the nasal process to any purpose. It is presumed that its use is to facilitate the discovery of food among decayed wood. In confinement it sheds the cuticular covering very frequently.

GENUS. LYRIOCEPHALUS. *Merrem.*

Head short, triangular. Eyebrow ridges high, prolonged behind. End of the muzzle with a large scaly prominence. Tongue thick broad, entire. Ear-drum hidden under the skin. Throat pouch small, compressed with an angular fold in front of the chest. Body, neck and tail compressed, with a small toothed crest. Scales small, subimbricate, with cross bands of larger ones. Femoral and pre-anal pores none.

LYRIOCEPHALUS SCUTATUS, *Wagler,*

The Lyriocephale, or Lyre Headed Lizard.

Syn. Lyr: MacGrigorii, *Gray.*
Lyr: marginatus, *Merrem.*
Lacerta scutata, *Linn.*

Nearly uniform dark green above, paler beneath or yellowish. Neck, back and part of tail with a dentated crest; two or three longitudinal lines of larger scales on each side of the back, with still larger scales intermixed with smaller ones on the sides; some of the larger scales keeled, scales of the belly, small, imbricate, slightly keeled. Those of the tail and limbs sharply keeled.

The largest specimen measured,

Head	1¼	inch.
Body	5½	„
Tail	8	„
Total length......	14¾	„ inches.

Geographical Distribution. Southern India, Ceylon,

The *Lyriocephale* is, as its name shews, easily distinguished from all other species of lizards in the Island, from its *lyre-shaped* head. We have not seen it in any other parts of the Island, but in the Kandian provinces; very abundant at Kaduganawa and other neighbouring parts of Kandy. It feeds chiefly on leaves and on coleopterous insects. In confinement boiled rice is freely taken. This lizard, too, changes its usual dark green colour into lighter or darker shades of green, and even into yellow and blue. It casts off its cuticular covering when long kept in confinement. The female lays from 3 to 4 hard shelled eggs, of about the size of sparrow's eggs.

Ears exposed, superficial.

GENUS. SALEA.—*Gray.*

Head quadrangular, covered with flat keeled, not imbricate scales. Occiput and sides of nape with a few scattered rather tubercular scales. Drum of ear exposed, superficial. Nape with a crest of two diverging series of rather compressed scales. Scales of the back rhombic, keeled, placed in longitudinal series, those of the lower part of the sides tending downwards of the back and belly elongated, rhombic, keeled, of tail rhombic, imbricate. Back keeled not crested. Tail elongate, tapering, with imbricate keeled scales, rather large beneath, rather keeled above, Femoral and pre-anal none. Toes 5-5 unequal.

SALEA JERDONII ?—*Gray.*

Dark purplish with blackish transverse bands, and occasionally with white streaks. Lips, cheeks and beneath white. Neck with a lax crest extending only half way down to the back, composed of elongated compressed scales some of them lying flat at times. Tail with an indistinct keeled crest. Length about 6 inches, of which the tail forms nearly half.

Geographical Distribution. India ? Ceylon.

The only specimen of lizard which we doubtfully identify with a species of *Salea,* was procured at Newera Ellia. We had not then Mr. Gray's description of *Salea Jerdonii* to compare it with, and the specimen is now with Dr. Andrew Smith. We are strongly inclined to believe it is a species of *Salea,* as many of its characters correspond with Gray's description, but we are very doubtful of its identity with the species named after Dr. Jerdon. This lizard was kept alive for several weeks under a glass, in very cold days it was observed to be very dormant even when removed from confinement, but the heat of the fire side would restore it to animation; it did not, however, exhibit the lively and brisk activity of *Calotes.* When dormant it was nearly of a black colour, even the white of the lips then disappeared.

Mr. Gray, observes (Annals and Mag: of Natural History Vol. XVIII page 429) that the genus *Salea* "is best distinguished from *Calotes* by the length and acuteness of the keeled scales of the back, sides, and under part of body, and their being all placed in longitudinal series."

GENUS. CALOTES—*Cuvier.*

GALEOTES.—*Schlegel.*

Head pyramidal, quadrangular, covered with small equal sized angular scales, interparietal scales very small. The tongue thick, fungous, slightly nicked. Nostrils lateral, near the end of the muzzle in a small shield. Throat more or less lax, without any cross fold in front of the chest, sometimes with a longitudinal fold on each side. Scales of the body directed towards the back, uniform, imbricate, in oblique cross rows; of the back large; of the crown smooth. Parotids spine bearing. Nape back and tail (?) with a crest of compressed scales. Femoral pores none.

CALOTES OPHIOMOCHUS,—*Gray*.

The Galeote, or Red headed Lizard.

Syn: Agama Ophiomachus,—*Merrem.*
Agama lineata,—*Kuhl.*
Agama acanthocephala,—*Kuhl.*

Above green with a bluish shade. Head generally lighter coloured often dark red. Nape also sometimes red. Beneath of a pale sea green. From four to five transverse white streaks on the body extending on the dorsal crest, a few also on the basal third of the tail. White streaks and spots on the limbs. Scales of belly and tail mucronate. Two small clusters of erect spinès on each side of head above the ears.

Head and Body	5½ inch.
Tail	8 „
Total......	13½ inches.

Some are larger.

Geographical Distribution. India, Ceylon.

This handsome *Calotes* is widely distributed in the Island, but not, so numerous as the common *Calotes Versicolor*. It is rarely seen in cultivated grounds; more frequently found in the jungle. When irritated, or alarmed at the sight of an enemy, the head and part of neck and its crest become of a blood red colour. When lying in a passive state the head is of a light yellow colour. Sometimes, parts of the head and neck put on a black colour. The white streaks are never obliterated, but the white spots on the limbs are often absent The lower two thirds of tail brown, with darker brown rings. This *Calotes* is in habits similar to the other species; they feed on insects and tender leaves.

In the young the white streaks are lined on each side with brown; the head is never observed in them to change into red.

CALOTES VERSICOLOR,—*Dum. et Bib.*

The Ghirget, or Blood-sucker. Cambelean (Port.). Kattoosa (Sing).

Syn: Agama versicolor,—*Daub.*
Agama Tiedmanni,—*Kuhl.*
Agama vultuosa,—*Harlan.*
Agama flavigularis,—*Daud.*
Agama Indica,—*Gray.*

Variable. Generally, of dusky brown with blackish interrupted transverse bands. Sometimes of a bright yellow body and reddish brown head and throat. Beneath pale. Two isolated clusters of spines behind the ears, the central one of each group higher than the lateral ones. Tail crested for about an inch of the basal portion, and generally marked with brown rings. Scales of belly and tail very prickly.

Head	1. 2-10	inch.
Body	4. ½	„
Tail	8.	„
Total length	13. 7-10	inches.

Some specimens are larger, but the above dimensions are about the average. Females smaller.

Geographical Distribution. India, Nepal, Affghanistan, China, Ceylon.

This Calotes is very generally distributed in Ceylon. It is found nearly in all parts of the Island in hedges and on trees. The great rapidity with which it changes its usual brown colour into a variegated yellow, green and red has led the European residents to call this lizard the CHAMELEON. The origin of the designation "Blood-sucker" (by which name it is still better known) cannot be satisfactorily traced; probably, this appellation was given to it from the occasional reddish hue of the throat and neck. When irritated, or during and for sometime after copulation, this reptile puts on its most gorgeous attire,—bright red, and yellow throughout, with scarcely a trace of brown spots and lines.

The young has not the whole of the dorsal crest developed, the head has two or more dark brown transverse bars, and two pale or yellow lines on each side of the back, and transverse spots more permanent than in the adult. It may be mistaken for a distinct species.

The female lays from 5 to 8 soft oval eggs about ⅝ in: in length in hollows of trees. The food of this *Calotes* also consists of insects, larvæ and worms, and likewise leaves and small berries. In a hot sunny day a solitary *Calotes* is seen on a twig or on a wall, basking in the sun with mouth wide open. After a shower of rain, numbers of them are seen to come down on the ground, and pick up the larvæ and small insects which fall from the trees during the showers.

CALOTES VIRIDIS. ?—*Gray*.

The Green Calotes.

Above of a uniform bright green colour. Beneath yellowish green. Sometimes the head is streaked longitudinally with black. Two small clusters of compressed erect spines above the ears as in *C. versicolor*. Nape and back crested with sharp pointed flattened scales, those on the nape erect, the dorsal portions depressed. Scales on the belly sharply keeled and very prickly. Tail brown with rings.

Head..................	1. inch.
Body..................	4. „
Tail	7. „

Total length..12 inches.

Generally smaller.

Geographical Distribution. Southern India? Ceylon.

This lizard we have only seen at Newera Ellia and its neighhourhood, where it is very numerous. In habits and manners like other species of *Calotes.* Having no specimen with us at present we are not able to compare it with Gray's description of. *C. viridis* (Annals and Mag. of Nat. Hist. vol XVIII). But the above description, taken at the time from fresh specimens, appears to correspond nearly with the characters of this species, described by Mr. Gray, and we remember seeing a collection of it at the British Museum, soon after its arrival from India, which Mr. Gray referred to his C. viridis. We have not observed this lizard change its bright green colour into any other but darker shades of green, with the exception of the few occasional black streaks on the head, cheeks and neck.

TRIBE. DENDROSAURA.

Scales of the belly, sides and back granular, in circular bands. Tongue elongate, subcylindrical, worm-like, very extensile, rather enlarged at the end. Eyes globular, very mobile, covered with a circular lid, pierced with a central hole. Body compressed. Toes 5-5, formed into 2 grasping *opposable* groups. Ears hidden under the skin. Old World.

FAM. CHAMELEONIDÆ.

The True Chameleons.

Living on trees, supporting themselves by their feet and prehensile tail; moving slowly, with regularity and affected gravity. Eating living insects and larvæ which they procure by the very rapid ejection of their elongated tongue, which is viscid at the top, and as quickly withdrawn. The Eggs, which are placed on the ground, under leaves, are round, the shell calcareous, white, spotless, very porous. The males are distinguished by the thickness of the base of the tail.

They inhabit Africa and Asia, and are naturalized in Southern Europe.

GENUS. CHAMELEO—*Laur.*

The only genus of the above described family.

CHAMELEO VULGARIS.—*Daud.*

The Indian Chameleon

Syn; Chameleo Zeylanicus.—*Laur.*
Chameleo Africanus.—*Laur.*
Chameleo calcaratus.—*Merrem.*
Chameleo mutabilis.—*Meyer.*
Chameleo Zebra.—*Bory.*
Lacerta Chameleon.—*Linn.*

"Occiput with a central curvilinear keel, high, and pointed behind, with a more or less distinct flap on each side behind, edged and covered with large scales like the cheeks; scales small, close, rounded; dorsal and vertebral line toothed." *Gray.*

Geographical Distribution, Africa, India, Ceylon,

Not having seen a live Chameleon, and the only one we have seen from Ceylon being one sent by Mr. Edgar Layard for Dr. Andrew Smith in a bottle with other specimens, we have substituted Mr. Gray's description of this species for one of our own.

The Chameleon has hitherto only been seen in the Jaffna or Northern district of the Island. It is a size larger than the *Lyriocephale.* It is very easily distinguished from the latter by the want of the knob on the nose, and the two grasping opposable groups of toes peculiar to the chameleon.

Whether the Chameleon changes its usual dark green colour more frequently, into various other colours than the *Calotes versicolor,* remains to be ascertained.

The habits and manners of the Chameleon are thus described by Authors. It is a creature of a harmless nature, feeding on insects, and is capable of enduring a long abstinence; hence arose the popular idea of the chameleon being nourished by air alone.

They are very slow, dull and torpid; often remaining in the same position for many hours together, or traversing the branches of trees in a slow and tortuous manner, with the aid of the grasping power of the feet and tail. The skin is composed of small granular scales; the lungs are large, and are connected (as in birds) with air cells that lie among the muscles and beneath the skin; hence the appearance of the animal varies greatly; for, according as these cavities are full and empty, it appears either full or bloated, or lean and shrunken.

The cause of the different changes of colour is accounted for in the following manner. "The *rete-mucosum* or coloured layer of the skin, contains two kinds of pigment, situated in different layers; the deep seated pigment is contained in branched cavities, and is movable, producing by its partial accumulation and varying proportions with the superficial layer, the changes of colour for which the chameleon has in all ages been remarkable." Whether this view of the cause of the chameleon's versatile colour, be correct or not, it is not applicable to the same peculiarity observed in other genera, such as *Sitana, Calotes,* or even *Hemidactylus.* There is something in this power of changing colour, so dependent on the will of the reptile, which is almost inexplicable; the nearest approach to correctness may perhaps be Mr. Hill's physiological reason recorded by Mr. Gosse, with which our own observations correspond. The changeability of colour is thus accounted for by Mr. Hill of Jamaica.

"It is now pretty satisfactorily determined, that the direct or more immediate cause of this peculiarity is physiological, and dependent on the action of the lungs upon the circulatory system. Their lungs are large, dilatable and prolonged, and the phenomenon itself most remarkable among Lizards, whose general cutaneous covering does not adhere closely or uniformly to the muscular layer beneath. A large portion of air enters below the skin; and as it is variously distributed, according to the state of the reptile, in respect to tranquillity or disquietude, it gives the many coloured lines we see so instantaneously accruing in them. Cuvier says, that in effect their lungs rendering more or less transparent, urge the blood to rush more on the skin, and according as the fluid fills itself or empties itself of air, its colour becomes more or less lively.' By the investigation of Mr. Houston (Tran: of Roy: Irish Acad: xv, 177.) the proximate cause of changeability is connected with the circulatory system. The skin of the changeable SAURIANS is not only very thin, but highly vascular; and he thinks that the colour of the blood appearing through the semitransparent covering, and being variously modified by its more permanent hues, is of itself sufficient to account for every diversity of tint which the creatures can assume. He maintains the opinion that these effects are produced by vascular turgescence, just as the increased redness in blushing is caused by a rush of blood to the cheeks.' I would seek in addition an illustration from the changeable hues in the caruncles of the Turkey. There, too, aeration produces a diversity of influences on the circulatory system. The red blood distributed through these parts increases and diminishes its intensity of tint, by the different aerations at the caprice of the bird, and being sometimes wholly deprived of its red particles flows colourless, as the fluids circulate in the white of the eye." An exactly similar phenomenon as in the Turkey is very distinctly observed in *Calotes Ophiomachus* when changing its usual green colour of head into a bright red. At first, a few red spots appear, which gradually enlarge and coalesce till the whole head and part of neck and nuchal crest assume a red colour. Gradually, too, the red colour disappears and the ordinary green is reinstated.

SECTION II. CATAPHRACTA.

Shielded Reptiles.

Body covered with square imbedded plates, generally forming a dorsal and ventral shield. The bones of the skull thick, united together into a hard mass, and including the quadrate bones and pteri goid processes. The tongue is short, affixed to the mouth, scarcely exsertible. The lungs are enveloped by a thick peritoneum which performs the part and has the appearance of a diaphragm. The vent is round or linear, plaited, The male organ and vagina are simple, the former having only a groove along its upper edge. Oviparous; the egg covered with a hard shell; the young, when hatched having a large umbilical slit which soon disappears.

ORDER. CHELONIA.

Tortoises.

The body enclosed in a case, formed of two shields united by their margins, and leaving only the head, neck, limbs, and tail free, which are covered with a scaly skin; the upper shield or thorax formed of the ribs more or less dilated on the sides, united together and adherent to the dorsal vertebræ by a toothed suture, preventing any motion, they are surrounded by a series of bones forming the edge of the shields, the lower shield or sternum is formed of four pairs, and a central anterior bone. The jaws are toothless, covered with a horny bill, rarely hid by fleshy lips; the upper bill covers the lower like a box. Eyes with distinct eyelids. The drum of the ear is visible, nearly superficial. The legs short, thick. Tail conical. The vent is a circular hole.

FAM. TESTUDINIDÆ.

Head ovate, shielded; jaws naked, nostril apical. Neck retractile into the cavity of the skull. Feet short, club shaped, armed with blunt claws. Shell very solid, thick, ovate; the ribs united together to the margin, in the adult state covered with horny concentrically grooved shields, marked with a permanent areola; marginal plates 24 to 26, the caudal pair always united together into one broad generally incurved plate. Sternum broad and solid, closed in the centre of the adult, and firmly attached to the thorax by a bony suture, covered by the end of the pectoral and abdominal plates. Tail short and thick. They are slow in their motions, eating vegetables and roots. In the colder climate they burrow and sleep during winter.

GENUS. TESTUDO.—*Linn.*

Thorax convex, subglobose, solid. Sternum solid, covered with 12 sternal shields; the gular pair separate, inguinal shields moderate. Head scaly, with 2 frontal shields above, and 1 vertical shield between the eyes. Claws 5—4, blunt.

TESTUDO STELLATA,—*Schweiger.*

The Starred Land Tortoise.

Syn: T. Actinoides,—*Bell.*
T. elegans,—*Schoeff.*
Le Geometrique,—*Lacep.*

Black with yellow rays. Shell ovate, convex; shields grooved; dorsal shields convex with a central yellow nucleus and five or six yellow rays, the medial shields hexagonal. Nuchal shield none. Head and feet black, yellow spotted. Sternum black, with yellow rays. The shell of largest specimen examined measured.

Length	11	inches.
Breadth	7	„
Height	5	„

Geographical Distribution.—India? Ceylon, Philippine Isles.

This handsome tortoise is very numerous in the Northern and

Eastern parts of the Island. The yellow rays vary in different specimens; in some the lines are very narrow and zig-zag. It lives for a long time in confinement feeding on grass.

FAM. EMYDIDÆ.

Terrapens.

Head rather depressed, covered with a hard or soft skin; jaws naked; nostril small, apical. Neck retractile into the cavity of the thorax. Feet depressed, expanded; toes—5—5, or 5—4, almost always webbed to the claws; claws sharp. Tail conical, shielded beneath. Thorax generally depressed, solid, with a distinct bony margin covered with horny plates. Discal plates 13, marginal 24—26, caudal always separate; sternal shields 11 or 12, gular pair sometimes united. The vertebræ of the neck bent in a perpendicular bow. Pelvis only united to the vertebræ. Rapid; living in fresh water ponds. Carnivorous, only taking their food while in the water. Egg oblong, white.

GENUS. EMYS,—*Bronig.*

Head moderate, covered with a thin hard skin; chin not bearded. Feet short, covered with scales; toes 5—4, strong, shielded above, webbed to the claws. Tail moderate. Shell depressed. Sternum solid, broad, truncated before, nicked behind, affixed to the thorax by a bony symphisis covered by the ends of the pectoral and abdominal plates, axillary and inguinal plates moderate, distinct.

EMYS TRIJUGA, ? VAR. *Schweig,*

The Marsh tortoise. Ibba,—*Sing.*
Syn: Emys Belangeri,—*Lesson.*
Testudo scabra,—*Shaw.*

Shell dark brownish black; oblong, ovate, depressed, rather flattened in the median line; three keeled, plates grooved. Sternum flat, slightly keeled on the sides, of a dark brown colour with yellowish lateral margins. Feet blackish. Head dark brown, with orange red spots and streaks.

In the very young animal, the colour is lighter and of an olive green shade. The central keel more elevated and the head and neck more minutely spotted red.

The largest specimen examined measured 13 inches in length, and 9½ broad in the middle; an ordinary sized one generally met with measures 8 or 9 inches by 6½ or 7 inches.

Geographical Distribution. India, Ceylon.

This fresh water tortoise is found in great abundance in all parts of the Island in pools and marshes; they will live for many months in dry grounds feeding on vegetable matter, so that they are not purely carnivorous. They have a very offensive odour; their movements on land and in water are quick. The natives prize this species as a cleaner of wells, where one or two are usually put in for the purpose.

We have not seen any Tortoise in Ceylon exactly corresponding with Gray's description of *Emys Seba.* Some of the larger specimens of *Emys trijuga*? have the grooves on the shields indistinctly marked, and in some the grooves are divergent instead of being areolar, or both combined.

FAM. TRIONYCIDÆ.

Soft Turtles.

Head flattened, ovate; eyes small; superior jaws horny, covered with dependant fleshy lips; chin not bearded; nostrils elongated into a thin cylindrical trunk. Neck long, contractile. Feet short, strong. Toes 5—5, short, expanded, strongly webbed; two outer clawless; claws 3. 3. Tail short, conical simple. Shell covered with a hard catilaginous skin, usually expanded and flexible on the edge, the ribs only united together and to the vertebræ above, separate below. Sternum formed of a ring of bones, covered with a continuous skin, and in the adults furnished with rough callosities on the prominent part. Pelvis only attached to the vertebræ. Living in rivers and lakes in warm climates, eating flesh, and rarely vegetables. Eggs spherical.

The ribs become united together for a greater length, and the sternal callosities appear and increase in size as the animal increases in age, hence they do not afford specific much less generic characters.

GENUS. EMYDA,—*Gray*.

Head moderate, ovate, narrow in front. Lips thin. Margin of the shell supported with a series of bones. Sternum broad, rounded before and behind, with a moveable valve over each foot. Sternal callosities (of adults) 5.

EMYDA PUNCTATA.—*Gray*.

The fresh water Tortoise. Kiri-Ibba,—*Sing*.

Syn: Testudo punctata,—*Lacep*,
Test. granosa.—*Schoepf*.
Test. scabra,—*Latr*.
Test. dura,—*B. Hamilton*.
Test. granulata,—*Shaw*.
Trionyx Coromandelicus,—*Geoff*.

Shell oval, convex, dark olive green, with indistinct transverse brown stripes and minutely punctulated. Beneath white or fleshy white. Sternum with 6 callosities. Head green, *black* striped. Lips yellow. Feet with 5 or 6 corneous scales. The largest specimen examined measured.

Head..................	2¼	inch.
Neck..................	7	„
Shell, long..............	13½	„
do., broad............	9	„
Tail	1½	„

Geographical Distribution. India, Ceylon.

This water tortoise is generally distributed in the lower parts of the Island, found in lakes and tanks. Several we kept alive for months in a tub filled with fresh water, fed freely on animal food, and also on bread and boiled rice. A large female laid three eggs, globular, about 1 inch in diameter, with a hard calcareous shell. This tortoise, too, is put into wells to act the part of Scavenger.

The shell is in fresh specimens smooth, and it is only in drying that the granular surface of the bony shell is apparent.

FAM. CHELONIADÆ.

Turtles.

Head globose, shielded; nostrils rather tubular; jaws horny, naked. Neck short, subretractile. Feet very long, not retractile, compressed, fin shaped; toes depressed, expanded at the end, and often armed with flat claws; front feet longest. Tail short, thick. Shell low, cordate, with a defined bony margin, covered with horny shields or a leathery skin. Ribs free at the end. Sternum ring like, cartilage none in the centre, and only united to the thorax by a cartilaginous suture. Seas of torrid and temperate Zones, some eating Algæ, as *Ch. Midas,* which are used for food, and imported as a luxury; others, Mollusca and radiated animals, as *Ch. Caretta,* only collected for their oil. The horny shields are used for ornamental purposes.

GENUS. CARETTA.—*Gray.*

Thorax ovate, cordate, covered with 13 thick, horny plates, which are produced and imbricate on their hinder edge. Muzzle elongate, compressed. Jaws with the edge straight, toothless, and the tip slightly recurved, side of lower jaw with a single elongated shield. Sternum keeled on each side.

CARETTA IMBBICATA.—*Gray,*

The Caret, or Hawks bill Turtle. Kookoeloo—Koossomboo,—*Sing.*

Syn : Chelonia imbricata,—*Schew.*
Testudo imbricata,—*Linn.*
Chelonia multiscutata,—*Kuhl.*
Ch. pseudo Caretta,—*Lesson.*
The Scaled Tortoise,—*Gren.*

Rich chestnut brown, marked or yellow rayed; back keeled. Sternum yellowishwhite. From 18 inches to 2 feet long.

Geographical Distribution. Atlantic and Indian Ocean.

The dorsal shields of this turtle are used for making combs and other ornaments. It is caught on the Southern Coast of the Island, very abundant at Point de Galle and Matura, from whence we saw several live individuals. It is rare in the Northern parts of the Coast of Ceylon. Some specimens are sold for as much as £4.—the price depends on the quality of the shell. It is said that the natives remove some of the shields while the animal is alive and return it to the sea. The shields are said to be reproduced, but for the truth of this we cannot vouch. The Natives eat the flesh of this turtle, but it is unpalatable to the European.

GENUS. CHELONIA.

Discal shields 13, not imbricate, truncated behind. Muzzle short, rounded. Jaws moderate, upper slightly notched in front and feebly toothed on the side; lower denticulated, with a single elongate plate on each side. The front toe of each fin clawed. Feeding on Algæ.

The last vertebral bone transverse, broad in front, with the last rib parallel, and arising from the sides of its base, the front edge of the second finger with four scales.

CHELONIA VIRGATA,—*Schweig.*

The Carey, or Indian Green Turtle. Gal-Koossombo,—*Sing.*

Syn: Chelonia fasciata,—*Cuvier.*
Chelonia Midas, var. D.—*Gray.*
Turtle of the Red Sea,—*Bruce.*

Shell rayed with chestnut brown and yellow. Sternum yellow, in the young whitish. Fin with a *single* nail.

From 2 to 3½ feet long.

Geographical Distribution. Indian, and Atlantic Ocean.

This turtle is found all round the Island,—very numerous in the Trincomalie harbour for several months of the year. A good sized one can be bought for 6*d.*, a very large one from 1*s.* 6*d.* to 2*s.* The flesh of this turtle is not far behind in flavour that of the well known green turtle *Chelonia Midas,* so famous for making *the* "Turtle Soup." The female lays from 100 to 200 eggs of a globular shape, with a soft semi-transparent calcareous shell, which are much prized as articles of food both by Natives and Europeans. A Native will consume as many as 20 or 30 eggs at one meal, and we have seen Europeans eat a dozen for breakfast.

ORDER. EMYDOSAURI.

Emydosaurians.

Head large, covered with a thin skin; ears linear, closed with 2 valves; gape wide; tongue short; jaws with a single series of conical teeth, inserted in sockets and replaced by teeth formed between them; hinder part of the lower jaw produced behind the condyle; nostrils small, anterior: eyes small. Throat with 2 glands. Neck and sides of the body with a wrinkled skin, covered with small tubercular scales. Back with a hard disk, formed by longitudinal series of square, keeled, bony plates, imbedded in the skin, under surface covered with smooth, thin square plates; back of the neck with 2 groups of bony plates,—the first called nuchal and the other the cervical plates. Tail compressed, with 2 series of compressed plates above. Vent longitudinal. Legs short, feet webbed; toes 4-5; but only the inner three of each foot clawed. Living in fresh and brackish water in tropical climates. Eating animals which they have killed by drowning.

Synopsis of the Families.

1. CROCODILIDÆ.—The lower canines fitting into a *notch* in the edge of the upper jaw. *Old World.*

2. ALLIGATORIDÆ.—The lower canines fitting into a *pit* in the upper jaw. *New World.*

FAM. CROCODILIDÆ.

GENUS. CROCODILUS.

Crocodiles.

Jaws oblong, depressed, tapering, rather dilated at the end. Teeth unequal, lower canines fitting into a notch in the side of the upper jaws. Feet fringed. Toes webbed to the tip. Nuchal and cervical plates forming a disk separated from the dorsal one by small granular scales. The head of the newly hatched specimens is short, but it gradually elongates and after a short time attains the form proper to the species, and through the bones becoming more solid by increasing age, they only slightly alter the relative proportions of the different parts; so the form of the head, taken with the shielding of the back, affords good characters for the determination of the species. *

CROCODILUS POROSUS, *Schw.*

The Indian Crocodile. Allie-Kimboola, *Sing.*

Syn. Crocodilus Ceylonicus ex ovo prodiens. *Seba.*
Crocodilus biporcatus. *Cuvier.*
C. biporcatus raninus, *Muller.*

Head elongate, narrow, (in the half grown and adult specimens twice as long as the width of the hinder part of the skull); upper jaw with *long continued ridge* from the front of each eye; nuchal plates small or wanting; forehead square, with nearly parallel sides, half as wide again as the muzzle at the anterior notch; muzzle at the 9th tooth nearly as wide as the space between the nose and eyes; scales of the back oblong, longitudinal equal in 8 rows. *Gray.*

Geographical Distribution.—India, Malayan Peninsula, Pinang Singapore, Tenasserim, Sumatra, Java, Timor and Seychelle Islands.

This Crocodile is common in the large rivers of the Island, and we believe it is the species found in the Mutwal river near Colombo, and also in the Southern provinces. Crocodiles have not been seen in the highlands. This species is easily distinguished from the next by its more robust make, darker colour, the upper parts are of a dark green, and covered with large black spots; beneath yellowish or greenish white. The largest specimen we have seen measured 16 feet

CROCODILUS PALUSTRIS, *Lesson.*

The Goa or Marsh Crocodile. Halle-Kimboola,—*Sing.*

Syn. Crocodilus vulgaris, Var. *E. Gray.*
Crocodilus biporcatus raninus, *Muller.*

Head elongate-oblong, triangular, convex and rugose above, with 2 *short irregular nodulose, sinuous ridges,* in front of the orbit, sides rather swollen behind the notch, rather more then half as long again as two thirds the width of the head behind; muzzle at the first notch nearly two thirds the width of the forehead; at the 9th tooth as wide as two thirds the space between the eyes and nostrils; forehead concave, with the sides nearly parallel in the young and converging towards the front in the adult. *Gray.*

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* Not having any skulls of Ceylon Crocodiles (Alligators, *Vulg.*) to describe from, we quote from Mr. Gray's valuable descriptions.

Geographical Distribution.—Malayan Peninsula and Islands, Java, Sumatra, Tenasserim, India, Ceylon.

This species is very numerous in the Northern parts of the Island. Found at Trincomalie in salt marshes, and in large tanks. It is of a pale greenish olive colour and spotted irregularly with black. Beneath yellowish white. The largest specimen we have seen measured 13 feet; some are said to be much larger. The following species, we only know of from seeing a single skull which answered to the characters of the species drawn by Mr. Gray.

CROCODILUS BOMBIFRONS, Atty-Kimboola,—*Sing.* *Gray.*

Face short, oblong, convex, rugose, pitted, *without any ribs in front*; sides only slightly converging, much swollen behind the notch; half as long again as the head behind, and at the 9th upper tooth as wide as from the back of the nose-hole to the orbit; forehead flat, with nearly parallel sides, nasal hole orbicular; suture of the intermaxillary straight, transverse, nasal hole round, back edge rather behind the middle of the notch of the canines. *Gray.*

Geographical Distribution.—India, Ceylon.

The skull, apparently of a middle aged individual, was sent to us from Colombo by Mr. Anthonisz of the Colonial Medical Department. Friends at Putlam and Chilaw will be able to ascertain, whether this is the species so numerous there, or is it *Crocodilus trigonops* of which Mr. Gray gives the following description.

Nuchal plates 4; cervical 6; large, strongly keeled; head oblong, triangular, convex, rugose above with 2 short, irregular, sinuous ridges in front of the orbit; and an oblong convexity upon each side above the 9th tooth, sides of the face rather swollen behind the notch, rather more then half as large again, as the width of the head behind; muzzle at the first notch nearly two thirds the width of the fore-head, at the 9th tooth nearly as wide as the space between the eye and nostrils; forehead nearly square. Found in India. *Gray.*

Since writing the above, we have had another opportunity of examining the specimens of Crocodiles and their Skulls in the Army Medical Officers' Museum at Colombo. There is one stuffed specimen with a head corresponding with Gray's *C. Bombifrons,* colour like that of *C. palustris,* nuchal shields 4, in 2 pairs, cervical shields 6, arranged in 2 pairs, one before the other, and one shield on each side, so as to make the outline of this arrangement almost lozenge-shaped. Between the nuchal and cervical shields there is only one row of smaller shields. In the specimens of *C. porosus* the 4 nuchal shields are continuous, and 6 cervical plates in two rows, the lateral ones rather smaller. Between the nuchal and cervical shields there are four or more rows of smaller keeled shields. In *C. bombifrons* there is only one such row. In *C. palustris* the arrangement of the nuchal and cervical shields are very like that found in the specimen which we identify with Gray's *C. bombifrons.* Taking this similarity and that of colour into consideration, we are strongly disposed to think with Mr. Blyth that *C. bombifrons* is only the male of *C. palustris.* There is also a stuffed specimen of a large Crocodile measuring 15½ feet long, with a head answering in a great measure to Gray's *C. trigonops,*—and there is also a skull corresponding to it. Nuchal and cervical shields as in *C. bombifrons* of Gray above noticed. The skull is 2 feet long. Greatest breadth 1 foot. Length from orbit to end of muzzle—1 ft.—2, 2-10 inch. Breadth at the notch 4 in., breadth at the 9 tooth 7½ in., at the orbits. 10 in., breath of temporal bone 6 in.

If *C. bombifrons* of Gray is the male of *C. palustris,* it is quite possible that *C. trigonops* is the male of *C. porosus,* as the nuchal and cervical shields may also vary in the sexes. One circumstance in favor of the supposition that *C. bombifrons* is a distinct species, is, that the specimen in the Museum was obtained from the neighbourhood of Colombo, where *C. palustris* is not known.

ADDENDA.

GENUS. GYMNODACTYLUS,—*Gray*.

Toes not widened into a disk, nor dentilated with margins; all five with non-retractile claws; fifth hind toe versatile or capable of turning from the others under a right angle.

GYMNODACTYLUS KANDIANUS, *n. s. nobis*.

Fulvous, or ochry brown, marbled and spotted with dark brown. Beneath dark grey, or whitish. Back granular, sides with two longitudinal distant series of minute spine-like tubercles. Tail rather depressed, angular on the sides, flattened beneath, with cross series of minute spines on the upper surface and a central series of broad scutæ on the under surface. Toes slender, compressed, moderately long, base slightly thickened, distinct transverse plates throughout the under surface; claws small, much curved. Lower rostral shield large; chin shields 2, large, four-sided, the rest granular. Pupil round. *Irides* golden. No femoral or preanal pore?

Head and body..................	1. 8-10 inch.
Tail.	1. 6-10 „
Total length......	3. 4-10 inches.

Geographical Distribution. Kandian hills, Ceylon.

This Gecko is, we believe, identical with the species found at Newera Ellia, of which we have not now a specimen. It is of a size smaller than *Hemidactylus frenatus*, and easily distinguished from that species by its slender, compressed and versatile toes, and the single series of plates on their under surface. The minute spine-like tubercles on the sides and tail retain a fulvous colour, even when the creature at times puts on a blackish or greenish hue in other parts. These spines are not very distinctly visible in specimens preserved in spirits. Mr. Gray's *Gonyodactylus Indicus* would seem to be closely allied to this species, but that it is not described as spine-bearing on the back or tail.

The *Gymnodactyle* is found in the higher Kandian hills, in native huts and out-houses on Coffee Estates, where rarely is any other species seen.

GENUS. PERIPIA,—*Gray*.

Toes free, dilated for their whole length, with 2 series of diverging plates beneath, last joint compressed, exserted, clawed. Thumb short, truncated, dilated, and with plates beneath, without any compressed last joint or claw. Male with femoral pores, female poreless. Tail roundish. Back with equal granular scales.

PERIPIA PERONII ?—*Gray*.

Peron's Peripia.

Syn. Hemidactylus Peronii, *Dum. et Bib*. H. leiurus,—*Gray*.

Above chocolate brown, spotted with darker brown whitish eyed spots. Beneath grey or whitish. Tail broad at the base, tapering, rounded above, under surface rather flattened, with a central series of broad 6-sided scutæ. Pupil vertical. *Irides* golden. Chin shields, 2 pairs elongated, central larger, and several smaller ones. Labial shields brown, white spotted. Femoral and preanal pores in one continuous line, 18 = 36.

Head and trunk..................	2. 2-10 inch.
Tail	2. 3-10 „
Total length	4½ inches.

Geographical Distribution.—Isle of France, Pinang, Ceylon.

Found on trees at Kaduganava. Dr. Cantor describes this Gecko as of an ash colour. The only live specimen we examined was of the colour above described: on immersing it in spirits it became of a pale ashy colour with inconspicuous whitish spots. This Gecko is easily distinguished from others known in the Island by its clawless thumbs and unarmed tail.

PART IV.

CEYLON AMPHIBIA.

CEYLON AMPHIBIA.

ORDER. BATRACHIA.

Skull formed of separate bones. Nostrils enclosed in a bony case, the internal nostrils opening on the sides of the middle of the palate. Gills of the young (and rarely of the adult animals) well developed and exposed, vanishing in old age. Skin naked, smooth. Body of young elongate. Tail often deciduous. Legs four, rarely only two.

SUB-ORDER I. SALIENTIA.

Body short, depressed, without any tail.

FAM. RANIDÆ, *Bonaparte.*

GENUS. RANA. *Linn.*

Skin smooth, hinder extremities very long, formed for leaping; toes palmated; teeth in the upper jaw, and in the palate.

RANA CUTIPORA ? *Dum et Bib.*

Above grass green, immaculate, with or without a dorsal line. Beneath white.

From 5 to 6 inches long.

Geographical Distribution.—India, Ceylon.

Found in the wet season in great abundance in stagnant pools at Colombo and Trincomalie.

RANA MALABARICA. *Auct.*

The Malabar Bull Frog.

Above light olive green, brown spotted. Beneath yellowish. The skin of the back becomes at times corrugated into longitudinal ridges. Limbs spotted brown. Some have a white medial line on the back.

Larger than the last species.

Geographical Distribution.—India, Ceylon.

Found at Trincomalie in paddy fields and other marshy grounds.

RANA BENGHALENSIS. *Gray,*

The small spotted frog.

Yellowish brown above, spotted with small brown or dark green spots. No dorsal streak. Limbs spotted and vermiculated. Beneath white; throat marbled, more or less distinctly. About 3 inches long.

Geographical Distribution.—India, Ceylon.

Among several specimens of frogs sent to Mr. Blyth from Trincomalie, he found a specimen of this species, which is the first he had seen out of Lower Bengal.

RANA TIGRINA. *Daudin.*

The Golden Frog.

Syn. Rana cancrivora, *Gravenhorst.*
Rana Brama, *Lesson.*
Rana regulosa, *Weigmann.*

Light yellow or olive brown, spotted black; pale yellow dorsal line, another on each side from the muzzle to the loins. Beneath white. From 5 to 7 inches long.

Geographical Distribution.—India, Tenasserim, Java, Sumatra, Ceylon.

This frog, known in Ceylon as the bull frog, is found in the Southern provinces, but it is not so numerous as the other species. From Colombo we have only seen two very large specimens.

RANA NEWERA-ELLIA. *nobis.*

Dark brown, nearly black; indistinctly spotted at times. A pale medial line on the back. Beneath pale brown or yellowish.

About 4 inches long.

Geographical Distribution.—Neilgherries? Ceylon.

This species, found at Newera-Ellia, has not we believe been described. There is another species at Badulla of a pale brown colour, spotted, of about the same size as the above described species, which we think may be *Rana Leschenaultii*, but not having a specimen of it when we met with a description of this species, we are only able to indicate the existence of a sixth species in the Island, specimens of which we have long ago forwarded to Dr. Andrew Smith.

FAM. HYLIDÆ.

GENUS. POLYPEDATES. *Tschudi*, apud *Dum* et *Bib.*

Terminal joints of the fingers and toes widened into a large disk; fingers slightly webbed at the base; Eustachian tubes large; in other particulars resembling *Limnodytes.*

POLYPEDATES LEUCOMYSTAX, *Gravenhorst.*

The common Tree Frog.

Syn. Hyla maculata, *Gray.*
Hyla leucomystax, *Graven.*
Polypedates leucomystax, *Tschudi.*

Variable. Upper parts generally of a dark buff, spotted brown or black. Sometimes seen of a chocolate brown, spotted or immaculate. At other times of a greenish brown or pale prey. From the muzzle to neck runs a black streak, which is always present. Beneath whitish. Limbs vermiculated with brown. Sometimes the limbs alone are spotted and the body spotless, or with a black diagonally crossed mark on the back.

A large individual measured—

Head............	¾ inch.
Trunk	2¼ „

Total length, 3 inches.

Geographical Distribution.—Pinang, Malayan Peninsula, India, Ceylon.

This tree frog is found in all parts of the Island, but more numerous in the Northern and Western provinces. It is not only found on trees, but in houses, and from its being frequently seen on white washed walls, it is better known in the Island as the "Chunam Frog."

Some specimens (which we take for this species) have a crucial mark on the neck, extending on the back, formed by a transverse and longitudinal fold of the skin; this mark is not permanent. Whether this variety includes the individuals from which Mr. Blyth makes his species *P. cruciger* remains to be ascertained.

POLYPEDATES STELLATA. *n s. nobis.*

Above bright green, with transverse darker bands, and irregularly spotted *white.* Limbs barred brown and spotted white. Beneath pinkish white. Body oval.

Total length about 2¼ inches.

Geographical Distribution.—Newera-Ellia, Ceylon.

We are indebted to Miss Barbara Layard for the only specimen of this beautiful frog found at Newera-Ellia. This frog, too, changes its green colour into a purplish brown, the transverse bands become brown, but the white spots are always present.

FAM. BUFONIDÆ. *Fitzinger.*

GENUS. BUFO, *Laurenti.*

Body inflated; skin warty, parotids porous; toes united by a rudimentary membrane; no teeth.

BUFO MELANOSTICUS, *Schneider.*

The Indian Toad.

Syn Bufo scaber, *Daud.*
Bufo Bengalensis, *Daud.*
Bufo carinatus, *Gray.*

Above brown, or yellowish red, spotted black. Beneath pale yellow. Crest of the head, lips and points of fingers and toes black.

From 3 to 5 inches long.

Geographical Distribution. India, Ceylon. Malayan Peninsula, Java, Tenasserim.

This toad is very numerous in all the lower parts of the Island; frequently found in drains and even in houses. It changes its colour when alarmed, from a yellow brown into a red or dark brown with black spots.

GENUS. ENGYSTOMA.—*Gray.*

No tympanum nor parotid visible externally, an oval body, the head and mouth very small, and feet but slightly palmated.

Above pale green, brown spotted, with a pale yellow medial line on the back. Beneath fleshy white. Length from 2 to 3 inches.

Geographical Distribution. India, Ceylon.

Rare in Ceylon. A few small specimens founed at Trincomalie on grassy lands, and one was caught in a bath room.

SUB-ORDER II. GRADIENTIA.

Body elongate, tailed in all ages. Limbs four, weak, small, equal Gills well developed in the young, decaying as the animal arrives at full age, very rarely retained through life. Teeth in both jaws, and often in the palate. Ears hidden. Internal nostrils in middle of palate, surrounded by bone. Vent longitudinal. Skin naked, smooth, or warty. Sternum and clavicle none. Ribs distinct or rudimentary.

No Salamanders or any other species of this Sub-Order of Batrachians found in Ceylon.

ORDER. PSEUDOPHIDIA.

Body elongate, sub-cylindrical. Limbs none. Skin smooth, wrinkled, with minute embedded scales. Tail extremely short. Vent open at the extremity of the body. Gill opening on the side of the neck, closed in the adults. Bones of skull united into a solid mass, Internal nostrils on the hinder part of the palate, surrounded by bone. Jaws with a series of teeth. Palate with an arched series of teeth in the centre, parallel to the maxillary one, and before the internal nostrils.

FAM. CŒCILIIDÆ.

Character and Synonyma of Order.

GENUS. ICHTHYOPHIS.

Head depressed, elongate. Muzzle obtuse. Maxillary and palatine teeth slender, acute, hooked. Tongue entire, velvet-like. Eyes distinct. A pit (or tentacle) below the eye, near the edge of the upper lip. Body fusiform, with numerous crowded circular folds.

ICHTHYOPHIS GLUTINOSUS,—*Gray.*

Syn: Ichthyophis Hasselti,—*Fitz.*
Epicrium glutinosum,—*Dum. et Bib.*
Cæcilia glutinosa,—*Linn.*
C. viscosa,—*Latr.*
C. hypocyanea,—*Hasselt.*

Brown, with a pale streak on each side. Mr. Gray gives 325 ring like plaits to a specimen from Ceylon presented to the British Museum by Sir Joseph Banks, Bart. The only specimens we have seen of this pseudophidian reptile are one in the Museum at Colombo, and one Mr. Fairholme sent to us from Dimboola, and which is now with Dr. Andrew Smith. We regret exceedingly that we have not had any opportunity of studying the live animal in any of its stages. Mr. Pieres of Kandy has sent us a mutilated specimen of an *Ichthyophis* of a brown colour above, and of a pale yellow brown beneath, without the side streak of *Ichthyophis glutinosus.* We are inclined to believe it to be identical with the variety Dr. Cantor describes, if not a distinct species. The tail and head are so destroyed that we cannot determine. Dr. Templeton, we understand, found a new species in the Island.

APPENDIX.

APPENDIX A.

SOME GENERAL REMARKS

ON

THE FLORA OF CEYLON;

BY GEORGE GARDNER, F. L. S.

Although Ceylon is celebrated for the luxuriant vegetation by which it is covered, the plants which compose it are less known to Botanists than those perhaps of any other portion of India of equal extent. While the history and uses of the vegetable productions of the possessions of the East India Company, and most of the Islands of the Indian Archipelago have been given to the world by modern Botanists, those of Ceylon are at the present day nearly as little understood in Europe as they were one hundred years ago, when Linnæus published his "Flora Zeylanica," founded on collections which had been made in the Island by Hermann, a Dutch Botanist, about seventy years before. It is true that during the last few years the descriptions of several Ceylon plants have been published in different scientific periodical publications both by Indian and European Botanists, but although a botanical institution has been maintained in the colony at the expense of Government for upwards of the last thirty years, those who have superintended it have done nothing almost either for their own credit or the honour of the establishment. Since the publication of the little book of Linnæus, the only work which has been produced on Botany is the "Catalogue of Plants growing in Ceylon," published, in 1824, by Mr. Moon, who was then Superintendent of the Botanical Gardens,—a work which never was of much use, and which is now quite obsolete, as being merely a catalogue, there are no characters by which to recognize the species he has enumerated. As connected with these observations, I may remark that I am at present engaged in preparing a work which will contain descriptions of all the vegetable productions indigenous to Ceylon, at least so far as I can obtain them, illustrated with coloured figures of some of the more rare, beautiful, or useful species. This, however, will be a labour of several years to come, as I have still to explore different parts of the Island, the productions of which are totally unknown.

The vegetation of all countries has its general character determined by two great principal causes—physical aspect and climate. The former having already been detailed in the preceding geological sketch of the Island, I shall here offer a few remarks on the latter. The two monsoons which occupy the greater part of the year materially influence the climate. That from the south-west lasts generally from April to September, while the north-east prevails from November to February, the intervening periods being subject to variable winds and calms. The western side of the Island, which is exposed to the south west monsoon, has a humid and temperate climate similar to that of the Malabar coast, while the eastern, which is open to the north-east monsoon, has a hot and dry climate similar to that of the Coromandel coast. The seasons and climates of the south-west and north-east portions of the Island are therefore very different. While on one side of the Island the rains are falling in torrents, the other is suffering from drought; and it not unfrequently happens that the opposite sides of a single mountain exhibit at the same time these opposite states of climate.

The great variety of surface and of climate, then, which the Island possesses, are favorable not only to a varied, but to a luxuriant vegetation, especially in its Central and Southern districts. From the study of plants taken in connection with these circumstances and their various other physical conditions, has originated the science of Botanical Geography, one of the most interesting branches of Botany, and one which some day will no doubt throw much light on the laws which have regulated the production and dispersion of species. It is only of late years that attention has been given to this subject, for, till the natural productions of different parts of the surface of the globe came to be investigated with the attention and accuracy which are peculiar to the present age, naturalists rested satisfied with the vague idea that all animals and vegetables had orinally radiated from a common centre, and that in the same parallels of latitude the same species would be found. This we now know not to be the case, and it can be as safely asserted that every large tract of country has had its own peculiar creation of both plants and animals, as that two and two make four, the exceptions to this general rule being accounted for by disseminating causes now in operation. In no other way can we account for Europe having a totally different class of plants from that part of North America which lies immediately opposite to it; or for the Botany of Southern Africa having little or no resemblance to that of the parallels in South America, or to that of Australia; or for many small Islands, such as that of St. Helena, possessing a vegetation totally different even from that of the nearest continent. Islands, however, in general approach nearest in the nature of their productions to that of the countries to which they most nearly range in a geographical point of view, and this we shall find to be the case with Ceylon.

But the climate and the soil of the maritime parts of the western side of Ceylon being very similar to that of the Malabar coast, we find that a large proportion of the plants of both places are identical; and the same holds good with reference to the northern and northeast coasts of Ceylon and that of the opposite Coromandel coast, although each district in both countries is found to possess species which are peculiar to each. A vegetation more or less similar to that of the coast extends inland to the foot of the great mountain chain; but from thence upwards a very great change is found to take place in it, and almost every thousand feet of elevation shows a vegetation which, though merging into those immediately above and beneath it, offers species which do not range beyond it. It is at an elevation of from 2,000 to 8,000 feet that the greater part of the species of plants peculiar to Ceylon are to be found; but most of these belong to forms, that is to natural orders or genera, which form part of the vegetation of neighbouring countries, such as the Neelgherry mountains in the peninsula of India, the Himalaya mountains, the high lands of Malacca, and of the Eastern Islands, but more particularly Java, and I have lately met with a few species which indicate an affinity with the continent of Africa.

I shall now offer a few remarks on the nature of the vegetation which characterizes the different botanical regions of the Island. The truly littoral plants of all countries offer a greater number of identical species in widely separated localities of the same parallels, than those of any other, and this, indeed, was to be expected from the fact that the ocean forms a ready medium for their transmission from one country to another by means of tides, winds, and currents, while at the same time their seeds, unlike those of most other plants, are not injured by immersion in salt water. Most of the shrubs which inhabit the muddy shores of the sea and of the salt lagoons which are so numerous towards the north of the Island, and which are known by the name of Mangroves, belong to that natural order of plants which Botanists call *Rhizophoreæ,* a tribe which is strictly intertropical. My researches have already yielded me about half a dozen species, all of which I find are common to Ceylon, the shores of the continent of India, and those of the Eastern islands; and the same I find to be the case with a few other shrubs belonging to other tribes, such as *Ægiceras fragrans,* which extends even to the shores of Australia, *Epithinia Malayana, Pemphis acidula, Dilivaria ilicifolia, Lumnitzera racemosa, Thespesia populnea* (the Tulip tree of Ceylon), and *Paritium tiliaceum,* the last having a far more extensive geographical range than any of the others, as I possess specimens in my herbarium from the shores of the West Indies, Brazil, and the Sandwich Islands, besides from various parts of India. The Cocoa-nut tree which gives so marked a feature to the West coast of Ceylon, and which is now so generally cultivated along the shores of all intertropical countries, is essentially a seaside plant, and has as good claims to be considered indigenous to Ceylon as to any part of the world. The same observations that apply to the shrubs of our shores, apply also to the herbaceous vegetation.

The great flat tract which extends between the sea-shore and the central mountain range, is possessed of a very extensive Flora, but as its general character is stamped by a few species which are very numerous in individuals, it is to them chiefly that my remarks will extend. In this tract a very great proportion of the species are identical with those of similar ones on the coasts of Coromandel and Malabar. The generally acid nature of its soil, together with its much drier climate than that of the interior is well shown in the Northern Province especially by the more wiry and stunted nature of the trees and bushes, their prickly stems and branches, and the smaller size of their leaves, together with a much greater proportion of fleshy shrubs, such as Euphorbias &c. The species which preponderate in individuals in the Northern province are different kinds of *Acacia*. mostly very thorny, the wood apple(*Feronia Elephantum*,) *Limonia alata*, *Salvadora Persica* (the true Mustard tree of Scripture, a tree which extends northward and westward to the Holy Land, and which I was the first to point out as a native of Ceylon), *Carissa spinarum*, *Gmelina Asiatica*, *Pleurostylia Wighii*, *Eugenia bracteata*, *Elæodendron Roxburghii*, *Ochna squarrosa*, *Cassia fistula*, *Cassia Roxburghii*, and *Memycelon tinctoria*. These are chiefly shrubs and small trees. The large trees, which are mostly of no great size, are two or three species of *Terminalia*, *Bassia longifolia*, the Margosa (*Azadirachta Indica*), the Satin wood (*Cloroxylon Swietenia*), the Ceylon Oak (*Schleicheia trijuga*), the Tamarind (*Tamarindus Indica*), and the Palmyra (*Borassus flabelliformis*), which is particularly abundant on the peninsula of Jaffna. * The mass of the herbaceous vegetations belongs to the natural orders *Scrophularineæ*, *Leguminosæ*, *Rubiaciæ* and *Compositæ*.

Proceeding southwards through this flat country, a considerable difference in the general appearance of the vegetation is observed, arising no doubt from the greater amount of rain which falls during the course of the year. The trees are not only larger, but their foliage is heavier and of a darker hue; and the numerous acacias which give so striking a feature to the north almost disappear. Between Colombo and Galle, shrubs belonging to the natural order *Euphorbiaceæ* are very numerous both in species and individuals, as well as a variety of *Rubiaceæ*, of which the beautiful *Ixora coccinia* is not the least common. It is only in this range that the pitcher plant (*Nepenthes distillatoria*), which is not, however, peculiar to Ceylon, is met with, growing in moist places and supporting itself among the bushes. About Galle, and from thence inland to the base of Adam's Peak, one of the most common shrubs is that which has been named, in honour of the great Humboldt—*Humboldtia laurifolia*; and on the low hills near Galle a few trees are met with which farther north do not exist under one thousand feet of elevation, but this is easily accounted for by the greater atmospheric moisture in that district. One of these trees is a new and remarkable species of durian (*Durio Ceylanicus, Mihi.*) It is in this district that the greater number of the Sugar plantations of Ceylon exist.

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* Since the above was written I have made a most important addition to the trees of this region, and, indeed, to the Flora of the Island, in the shape of the far-famed Upas-tree of Java and the Moluccas (*Antiaris toxicaria*), having discovered some fine large trees of it a few miles to the eastward of Kornegalle, early in August of the present year (1847). This discovery proves how little the investigation of the vegetable productions of Ceylon has hitherto been attended to. (G. G.)

The east side of the Island being much drier than that of the west, the consequence is that its vegetation has more of the character of that of the Northern province than of the opposite coast. It must, however, be remarked that, with the exception of the immediate neighbourhood of Trincomalie and of Batticaloa, the eastern side of the Island is a *terra incognita* to the Botanist.

Generally speaking, the first two thousand feet of the mountain range is covered with a dense forest of large trees, which are characterized by foliage of a much larger size than that of the low-country forests, and nearly of a uniform dark green colour, except, indeed, when the large Iron-wood tree (*Mesua Ceylanica*) is putting forth its young leaves, which are of a blood-red colour, and at that season give a remarkable aspect to the forest. To the general observer the trees of the next two thousand feet appear but little different from those of the first, but the eye of the Botanist can at once detect many species in both that are peculiar to each. The mass of the herbaceous vegetation of both is made up of *Ferns*, *Scitamineæ*, *Urticaceæ*, *Cyrtandreæ* and *Compositæ*. One of the most marked features of the second two thousand feet is the existence of large open grassy tracts on the sides of the hills to which the natives give the name of Pattanas. Such tracts extend to the highest parts of the island, differing more or less at different elevations in the natnre of their vegetation. Scattered through the lower ones, and giving them an orchard-like appearance, are two trees which are almost peculiar to them. These are the *Careya arborea*, and *Emblica officinalis*. The herbaceous vegetation consists chiefly of numerous tall coarse grasses, growing for the most part in tufts, the most common of which is the Lemon Grass (*Andropogon Schoenanthus*), intermingled with which are several *Compositæ*, principally consisting of several species of *Blumea*, *Knoxia Corymbosa*, the representative of the old and accurate historian of Ceylon, the broom-like *Atylosia Candollii*, and *Impatiens Balsamina*, the origin of the common garden balsam. It is on the forest land of this tract that the principal Coffee estates have been established.

The next two thousand feet, which brings us to an elevation of 6,000 feet above the level of the sea, and into a region which has a much lower temperature than any of the preceding, is still covered with forest having occasional patches of Pattana, but both give support to a very different vegetation. The trees are much smaller, grow closer together, have their stems and branches covered with pendulous masses of lichens and mosses, and many kinds of small *Orchideæ*. Their leaves are mostly small, and their varied tints remind one of the autumnal forests of more temperate climes. The under-vegetation consists of numerous species of beautiful herbaceous and suffruticose Balsams (*Impatiens*), a great variety of suffruticose *Acanthaciæ* (Nilu), beautiful and delicate Ferns of all sizes, from those scarcely a few inches in height, to tree ones which throw up their stems surmounted by large masses of verdant fronds to an elevation often of twenty feet, and rivalling in gracefulness the Palms of the low country. It is in this range that the lovely Tree-Rhododendron, which is so common in more elevated tracts, first makes it appearance, The Pattanas at this elevation are more spongy in their nature than those below, the grasses which are peculiar to them grow more closely together, and are smaller and more wiry in their texture; while the shrubs which are scattered through them are principally species of *Hedyotis*, and *Osbeckia*, the latter producing beautiful large rose-coloured flowers.

The two thousand feet which succeed to these include the most elevated portions of the island, and embrace chiefly the mountain-tops, and the vallies or plains which divide them from each other. The vegetation of this region has still a more alpine aspect than the preceding one, and of all the others is that which is possessed of the greatest interest to the Botanist, from the great number of European forms that are mixed up with those whose range does not extend beyond the tropics. The tree that first claims our attention in this range is the Rhododendron, not only from its great beauty, but from its vast abundance especially in the open plains, which during the months of June and July are clouded with red from the great profusion of its blossoms. I have met with two well-marked varieties, if they are not, indeed, distinct species of this tree. One of them is principally met with in the plains or in their wooded margins, and is easily recognized by the rusty-coloured under side of its leaves. This is the variety which is so common on the open plains of the Neelgherry range of mountains in the peninsula of India. The other variety, so far as I am aware, is peculiar to Ceylon, and is always found in the forest and at a greater elevation than the other. It is distinguished by its greater size, and the silvery under side of its leaves, which are besides narrow and rounded at the base, not broad and cordate as in the other. Several fine trees of this variety occur on the ascent of Pedrotalagalle from Newera-Ellia, and close to the temple on the summit of Adam's Peak; but the finest I have met with in my excursions among the mountains of the interior, was in crossing over Totapella, where there is a large forest of them, many of which are from 50 to 70 feet in height, and with stems more than three feet in diameter. In these forests are also to be met with some four or five species of *Michelia*, the representative of the Magnolias of North America, several arboreous *Myrtaceæ*, and not a few *Ternstromiaceæ*, the most common of which is the Camelia-like *Gordonia Ceylanica.*

There is much here to remind the European of his native country Different species of *Rubus* and a Barberry abound along the wooded margins of the plains, as well as two species of *Viburnum* or Guelder Rose, and a shrubby St. John's wort (*Hypericum Mysorense*), bearing large yellow flowers. The dry open banks are covered with violets and *Lysimacheaæ*, while in the open plains are to be found two species of *Potentilla*, an *Anemone*, a *Geranium*. two kinds of *Ranunculus* or butter-cup, a Ladies' mantle not unlike the *Alchemilla vulgaris* of England, a little blue star-blossomed Gentian, two species of sun-dew or *Drosera*, a campanula, a *Valeriana*, and in the bogs several kinds of *Juncus* and *Carex.*

At the health station on the plain of Newera-Ellia, which is about

6,200 feet above the level of the sea, there are several gardens in which most of the vegetables of Europe grow freely. European fruit trees have also been tried, but no success has attended the experiment: nor was such a thing to be expected, for although during the cold season the thermometer falls occasionally in the morning to nearly the freezing point—the annual range being 35½° to 80°, with a mean daily variation of 11°—, the cold is not sufficiently intense nor of long enough continuation to give those trees the period of rest which they require. In place of losing their leaves for nearly six months of the year, the Peach and the Cherry are here evergreens, and are hence kept in such a continued state of excitement as to prevent their bearing. The Peach does, indeed, give a poor crop of fruit of a very inferior quality, but although the Cherry blossoms annually its fruit never comes to perfection.

Although the Neelgherry range, from its near geographical position, has more species in common with the tracts of a similar elevation in Ceylon than any other part of India, yet these from their small numbers are evidently only stragglers northward, the very great number of species peculiar to the mountains of Ceylon, and to them alone, proves that these mountains form a distinct centre of creation. This I shall illustrate by a few examples from some of the better known natural orders and genera of plants. Beginning with *Ranunculaceæ* we find three species of *Ranunculus* belonging to the Flora of the Neelgherries, and two to that of the mountains of Ceylon, one species only being common to both countries. Of *Magnoliaceæ* Ceylon, possesses four or five species of *Michelia*, all of which are different from the solitary one which is found on the Neelgherries. Each country has a violet peculiar to itself, with another that is common to them both. Both places possess about half a dozen species of *Elæocarpeæ* each, but only one is held in common; and the same is the case with the order to which the Tea belongs—*Ternstromiaceæ.* The genus *Impatiens*, that to which the garden Balsam belongs, affords one of the strongest arguments which can be offered in favour of the fact I am now illustrating, for while each country possesses upwards of twenty species, certainly not more than three are common to both, and none of the other Ceylon species are known to exist elsewhere. Of *Rosaceæ* we find that the Neelgherry range has only three species of *Rubus*, while there are no less than eight found on the mountains of Ceylon, three of which are peculiar to them. Both countries have an *Alchemilla* in common, while the Agrimony of Ceylon does not exist on the Neelgherries, but is found abundantly on the *Himalaya* range; and I have lately described a new species of *Poterium* from Adam's Peak, the only one which has hitherto been met with in India. Two species of *Potentilla* grow in Ceylon, and three on the Neelgherries, one only of which is common to both countries. A comparison of this kind might be run on with to a great length, but enough has already been shown to prove that while the Flora of the central part of the Island has more affinity with that of the Neelgherries than with any other part of the world, yet it must have had a creation of its own, nearly allied, indeed, to the other in forms, but very distinct in individuals.

Although many of the genera found in the upland regions of Ceylon are such as are common in Europe, yet none of the Ceylon species are identical with European ones. Indeed, there is not to be found growing really wild in the Island, a single species exactly the same as any European one. There are, however, a few which have become more or less naturalized, having been introduced along with garden and other seeds. These are the common sow thistle (*Sonchus Oleraceus*), the common Chick-weed (*Stellaria Media*), the Mouse-ear Chick-weed (*Cerastim vulgatum*), the Corn Spurry (*Spergula arvensis*), and the annual meadow-grass (*Poa Annua*). All these with the exception of the first, which is much more general, are mostly confined to the plain of Newera-Ellia. In all countries plants which are introduced from others and find a congenial soil and climate, and which produce their seeds in profusion, and of a nature to be easily blown or carried about from place to place, are sure to naturalize themselves, and often in the course of a few years are not to be distinguished from those which are really original denizens of the clime. Besides those from Europe just enumerated, there are many others natives of distant tropical countries which are now rapidly spreading themselves on the Island; and as it is of the utmost importance to distinguish them from those which are truly natives, I shall here enumerate all those species of which I possess sufficient evidence to establish their exotic origin, and mention the countries from which they have been brought.

The two species of Prickly Pear (*Opuntia*) which are now so common in dry sandy localities in the low country, are natives of the tropical parts of the Continent of America, as, indeed, the whole of the *Cactus* tribe is. The beautiful rose coloured Periwinkle (*Vinca rosea)* which has so completely overrun the Cinnamon gardens at Colombo, and other similar localities, is a native of the island of Madagascar, though it has now perfectly established itself in nearly all tropical countries. The climbing *Alamanda cathartica*, with its dark green leaves, and golden bell-shaped blossoms, is a native of the Guianas, and was no doubt introduced by the Dutch. The Lantanas, which are to be met with almost every where in bushy places and in hedges, are natives of the West Indies; and such also is the case with the yellow flowered *Turnera ulmifolia* which is common by road-sides about Colombo. The Cape Goosberry (*Physalis Peruviana*) now so common about Rambodde and Newera-Ellia, is a native of the mountains of Peru. The four o'clock plant (*Mirabilis Jalapa*) common about Kandy, is a native of Mexico and the West Indies; and the Ipecachuana plant, as it is erroneously called, (*Asclepias Curassavica*) with its orange blossoms, and seeds with long silky tails, is a South American. Most of these must have been long established before the English took possession of the country; but the following are well known to have escaped from the Botanical gardens at Colombo or Peradenia during the last five-and-twenty years. The small white flowered *Passiflora foetida*, now so common a weed everywhere, is a native of the West Indies and Brazil, and was only introduced to the Island, by Mr. Moon, so short a time ago as 1824. Two species of *Crotalaria—C. Brownei*, a native of Jamaica, and *C. incanna*, a native of the Cape of Good Hope; the Mexican Coreopsis-like *Cosma caudata;* the Peruvian blue-flowered *Nicandra physaloides*; and the South-American sensitive plant (*Mimosa pudica*), are now not only common weeds about Peradenia and Kandy, but are fast extending themselves in all directions, the first mentioned species having now nearly reached as far as Rambodde on the Newera-Ellia road. *Brucea Sumatrana*, a shrubby native of the Eastern islands, and an escape from the Peradenia gardens, now forms part of the low jungle on the neighbouring Hantane range: and *Baddleia Madagascariensis*, a native of Madagascar, and two small kinds of Passion flower (*P. Suberosa* et *glauca*) both natives of the West Indies, are fast following. *Ageratum conyzoïdes*, everywhere a common weed, and one of the great pests of the Coffee Planter, is of American origin, though now thoroughly naturalized in all tropical countries.

The above, though only a rapid sketch of the more prominent features of the vegetation of the Island of Ceylon, is sufficient to shew the great interest and variety of the materials of which it is composed, and of the relation which it holds to that of other parts of the globe. Much, however, still remains to be done before a detailed exposition of it can be offered to the world.

APPENDIX B.

DESCRIPTION OF BOS GAURUS;

BY

WALTER ELLIOT Esq. Madras Civil Service.

BOS (*Bibos*) CAVIFRONS, *Hodgson*.

Syn. Bos Gaurus—*Griffiths*.
Gour—*Geoffroy*.
Karkona—*Canarese*.
Jungli khoolga - *Dekhani*.
Gaviga...*Mahratta*.

It differs very remarkably from the common ox. and though it approaches considerably more to the descriptions of the bison, the name generally applied to it by English sportsmen, it exhibits marked structural differences excluding it from the Bisontine group as defined by Cuvier. These consist in the plane of the forehead being flat and even slightly concave, and in the possession of only 13 pairs of ribs. It is not improbable that it will be found to constitute a connecting link between the Bisontine and Taurine groups. The most remarkable characters in the animal are an arched coronal or convex bony ridge, surmounting the frontal bone, and projecting beyond it so as to make the line from the vertex to the orbit a concave sweep; the continuation of which from the orbit to the muzzle is slightly convex. The other distinctive mark is the prolongation of the spinous processes of the vertebræ of the back, from the withers to the loins where they cease abruptly. These processes are 12 in number, and their prolongation gives the animal a very extraordinary appearance. The head is very square and shorter than in the common ox; the forehead ample, the body ridge rising about five inches in height from the plane of the frontal bone over which it inclines. When viewed behind it rises suddenly and abruptly from the nape of the neck, from whence it measures seven inches; the horns make a wide sweep in continuation of the arched bony ridge, and turn slightly backwards and upwards forming an angle of about 35° with the frontal bone; the whole head in front, above the eyes, is covered with a coat of close short hair of a light greyish brown colour, which below the eyes is darker, approaching almost to black. The muzzle is large and full, and of a greyish colour; the eyes are smaller than in the ox, with a fuller pupil of a pale blue colour; the ears are smaller in proportion than in the ox; the tongue is very rough and covered with prickles; the neck is short, thick and heavy; the chest broad; the shoulders very deep and muscular; the forelegs short, the joints very short and strong; the arm exceedingly large and muscular. Behind the neck and immediately above the shoulder rises a fleshy gibbosity or hump, the same height as the dorsal ridge, which is thinner and firmer, rising gradually as it goes backwards and terminates suddenly about the middle of the back. The hind quarters are lighter and lower than the fore, falling suddenly from the termination of the ridge, the tail very short, the tuft only reaching down to the hocks.

The skin on the neck and shoulders and on the thighs is very thick being about two inches in this one, which has already shrunk from lying in the sun. Ribs, 13 pairs.

The cow differs from the male in having a slighter and more graceful head, a slender neck, no hump, a less defined dew-lap, and the points of the horns do not turn towards each other, but bend slightly backwards; the horns are smaller too, and the frontal bone narrower, but the coronal or ridge is distinctly marked. The bulls have the forehead broader in proportion to their age. In the young bull it is narrower than in the cow and the bony ridge scarcely perceptible. The horns too in the young specimen turn more upwards.

The general colour is dark brown, the hair thick and short, but in old individuals the upper parts are often bare. That on the neck and breast and beneath is longer, the skin of the throat is somewhat loose giving the appearance of a slight dew-lap. The legs are white with a rufous tint on the back and side of the forelegs. The skin of the under parts when uncovered is a deep ochry yellow. The cow has the legs of a purer white.

The breeding season is said to be early in the year and the calves are born after the rains. The bulls are often found separate from the herd which consists generally of from ten to fifteen cows and a bull. They generally feed during the night browsing on the young grass and tender shoots of the bamboos of which they are very fond. In the morning they retire to some thicket of long grass, or young bamboos where they lie down to ruminate. When disturbed the first that perceives the intruder stamps loudly with its foot to alarm the rest, and the whole rush through the forest breaking down every obstacle and forcing their way with a terrific crash,

——————— dat euntibus ingens
Silva locum, et magno cedunt virgulta fragore
Æn. vii, 676.

For the following particulars derived from the observation of the animal in the Shervaroyah hills, I am indebted to Mr. Fischer, of Salem. "The Bison ordinarily frequents the hills, seeking the highest and coolest parts, but during the hottest weather, and when the hills are parched by the heat, or the grass consumed by fire, the single families, in which they commonly range the hills, congregate into large herds, and strike deep into the great woods and valleys; but after the first showers, and when verdure begins to re-appear, they again disperse, and range about freely. In wet and windy weather, they again resort to the valleys, to escape its inclemency, and also to avoid a species of fly or gnat which harrasses them greatly. In the months of July and August, they regularly descend to the plains, for the purpose of licking the earth impregnated with natron or soda, which seems as essential to their well-doing as common salt is to the domestic animal when kept in hilly tracts."

I may add, that the persevering ferocity of the Bison of the sub-Himalayan range, described by Mr Hodgson, is quite foreign to the character of the animal in the Southern forests. When wounded, it is true, it charges its assailants with determined courage, and many instances have come to my knowledge of its doing so with fatal effect, among which I may cite those of two officers within the last few years, both of whom were killed at the Mahabaleshwar hills; but in general it will always seek its safety by flight, if permitted.

Madras Journal of Literature and Science.

FELIS JUBATA. *Linn.*

The Hunting Leopard, or Chetah of India.

Size of both sexes about that of a greyhound; body slender; legs very long; claws semiretractile. Belly and inside of thighs of extremities white, the rest pale yellow, studded with small round black spots, larger on the back and outside of thighs. Hair of the upper part of the neck and withers rather long, forming a small mane. A black stripe on the ears, and another from the corners of the eyes to the angle of the mouth. Tail annulated with black and white bars, and tipped with white *

FELIS BENGHALENSIS. *Penn.*

The Wagati of the Mahratta of the Ghats.

The *Wagati* (an adult male) is 26 inches long, from the muzzle to the insertion of the tail, which is nearly 11 more—in all nearly 37 inches. The colour is pale-yellowish grey; darker on the back; yellowish white or pale yellow on the sides; white on the under parts of the body. The forehead has 4 longitudinal spots. In a line with these, from the vertex, four lines run to the shoulders, the outer broader, the centre ones narrower, and these two last are continued almost uninterruptedly to the tail; the others break diagonally into large longitudinal spots, which are continued in rows of smaller round spots to the centre of the belly. There are about six rows on each side, exclusive of the two dorsal lines. Two smaller bands run from the eye, and along the upper lip, to a throat band running transversely below the ears. Two other similar transverse bands cross the breast with a row of spots between. The inside of the arm has two broad bands, and the soles are dark brown or nearly black. The tail is spotted on the upper half and indistinctly annulated towards the tip. It is very fierce—living in trees in the thick forests; and preying on birds and small quadrupeds. A *shikaree* declared that it drops on larger animals, and even on deer, and eats its way into the neck; that the animal in vain endeavours to roll or shake it off, and at last is destroyed.* *Walter Elliot.*

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* There is a drawing of such an animal in the Army Medical Officers' Museum at Colombo, said to have been taken from a live specimen, but where the animal was brought from cannot be ascertained.—E. F. K.

OBSERVATIONS ON THE PALM SQUIRREL (Sciurus palmarum of authors)

By G. R. Waterhouse, Esq.

In the description given by Buffon of the Palm Squirrel (*Histoire Naturelle*, tom. x.), two animals are referred to that species which are there stated to differ in their colouring. I have reason to consider these two animals specifically distinct, although I believe they have always been confounded; and my object in the following observations is, to show that, besides the distinctions mentioned by Buffon, well marked points of difference may be observed, upon a careful examination, which appear to have escaped the notice of that distinguished naturalist

The animal which that author describes in detail (that is the first specimen mentioned) I imagine is the young of a species of which I have examined some hundreds of skins. It may be described as follows:

Above brown, with three (or five) longitudinal white lines; external surface of the limbs greyish; sides of face (below the eye), the chin, throat, under parts of the body, and inner side of limbs, white; tail having the hairs variegated with black, white and cream colour.

The hairs on the head are black at the base, then ochreous, and at the point black; the ochreous tint, however, is more prevalent, especially on the muzzle, if we except a little longitudinal ridge of black hairs which runs from the tip of the nose backwards. The hairs on the upper parts of the body (except those which constitute the white lines) have their basal half black, and their apical half rusty-yellow; the extreme points, however, are generally blackish, and some of the hairs are totally black. The general tint produced by this mixture of of colour is deep-brown. A slender line, which is generally of a deep cream colour, runs along the middle of the back, and extends from the occiput to the root of the tail: parallel to this (leaving an interstice of about four lines in width) is another line, which is almost always white; this line commences at the root of the tail, and is continued, along the body, as it were through the ear, and over the top of the eye. On the outer side this line is bounded by a band which is almost black, and which commences on the shoulders, (where it is very narrow), and extends almost to the root of the tail: in the middle it is about four lines in width, but towards the haunches, as well as at the shoulders, it blends into the general line, which covers those parts, and likewise the external side of the limbs. The sides of the body (between the fore and hind legs) are of a pale greyish-yellow hue; this tint, however, is separated from the dark band just described by a yellowish white line. The sides of the muzzle, and that part of the face which is below the eyes, as well as all the under parts, are white or approaching more or less to cream colour. The hair which covers the upper surface of the feet is white, cream-colour or sometimes grey-white. The hairs of the tail are of a dirty pale-yellow at the base: this is followed in succession by black, pale-yellow, then again black; and ultimately white; the two latter colours being more conspicuous. The ears are covered internally with short yellowish white hairs, and externally with minute hairs of the same colours as those on the top of the head. *

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* When at Kandy in 1850, a large tiger cat was brought to us in a very decayed state, which we took for a large specimen of *F. Viverrinus*, but we have since some reason to think that it was a specimen of the above described animal. The skin of it we have sent to Fort Pitt Museum.—E. F. K.

GENUS. RHINOPOMA. *Geoff.*

Two incisors in the upper jaw, four in the lower. Nose long, conical, cut square as it were at the end, and surmounted with a small leaf. Nostrils straight, transversal and operculated. Ears large, earlet (oreillon) external. Tail long, enveloped at its base in the interfemoral membrane which is cut, as it were, square, and free at its extremity.

Dental formula; Incisors $\frac{2}{4}$, canine $\frac{1\text{-}1}{1\text{-}1}$, molars $\frac{4\text{-}4}{5\text{-}5}$

GENUS. DYSOPES. *Illiger.*

Two incisors above and four below, two canine each jaw, four molars on each side of the upper jaw, that is to say, two false molars, and two normal; ten molars in the lower jaw, viz., four false and six true.

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* The above description is of *Sciurus palmarum,* verus, Buffon, which has not yet been observed in Ceylon.—E. F. K.

GENUS. ERINACEUS *Linn.*

Hedgehog or Urchin.

Have the body covered with prickles instead of hairs. The skin of the back is furnished with such muscles that the animal by inclining its head and feet towards the belly, is enabled to inclose itself as in a purse, presenting only its spines towards an enemy. The tail is very short, and their feet have each five toes. They possess in each jaw six incisors, of which the middle are the longest; and on either side three false molars, three bristled molars, and a small tuberculous tooth.—Cuv.

Several species are found in India.

GENUS. TUPAIA. *Raff.*

Banxring.

A genus allied to the Hedgehogs, only that their middle superior incisors are proportionately shorter, and there are four to the lower jaw, more elongated, (and projecting as in the Lemurs); they also (do not) want the tuberculous tooth behind. These animals are covered with hair (soft and glistening, but not fine in texture), and have a long bushy tail; and contrary to the habits of the other Insectivora, they ascend trees with the agility of a squirrel, but their pointed muzzle renders them easily distinguishable, even at a distance. Cuv.

One species (*Tupaia Ellioti*, Waterhouse) is found in India. (Mag. Nat. History.)

APPENDIX C.

NOTES and Description of some new or little known species of Ceylon birds: by Ed. Blyth, Esq. Curator of the Bengal Asiatic Society's Museum. From the Journals of the Asiatic Society. *

ATHENE CASTANOTUS. *Blyth.*

Entire mantle and wings uniform deep chestnut; rufous more or less obscurely barred with subdued dusky; primaries weak, dusky, faintly banded with rufous on the inner web, and with a series of spots of bright rufous on the outer web; tail dusky with eight or nine narrow white or whitish bars, the last of them terminal; head and neck closely barred with a light rufescent on a dusky ground, and contrasting stongly with the rufous of the back, breast nearly similar, but the colours deeper; the abdomen white with longitudinal dusky streaks, and the vent and tail coverts pure white; bill pale yellow. Length of wing about five inches.

Remarks,—Dr. Templeton was the first to have noticed this owl in Ceylon. We have obtained specimens from Newera-Ellia. It appears to be confined to the highland districts of the Island, from whence also we have obtained *Scops sunia*, Hodgson, which Mr. Blyth now considers to be only a variety of *S. aldrovandi*, of Ray.

GRACULA PTILOGENYS. *Blyth.*

No bare skin on the cheek, but the occipital lappets are well developed, and the basal half of the lower mandible is black, bill moderately strong. Length of wings six inches. Colouring as in the others.

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* The "remarks" are mine.—E. F. K.

Remarks.—This *Maynah* or *Saeyrooh* is confined to the mountainous parts of the Island; particularly common about Newera-Ellia where the well known *Gracula Religiosa* is not seen. The specimen from which Mr. Blyth describes this new species was sent to him by Dr. Templeton. The natives prize this species more than the other for the greater facility it has of acquiring a few words of their language.

RUBIGULA GULARIS. *Jerdon.* Female.

Length about six inches and a half; wing two inches and seven-eighths; tail two and three quarters of an inch, and tarse five eighths. Colour olive green above, below yellow throughout, sullied with greenish on the breasts and flanks; cap and ear coverts black, but no black chin spots; the tail dusky or blackish laterally, edged with green towards its base, its four outer feathers having a largish white spot at tip, and the two central pairs being successively more narrowly tipped with the same. Bill and feet black. If new, R. ABERRANS, *nobis;* but I repeat my suspicion of its being the female of *R. gularis.*

DICRURUS EDOLIFORMIS, *Blyth.*

This well marked species would seem to be a common bird in Ceylon. It much resembles the ordinary subcrested bird of the Malayan Peninsula, except that its tail is found as in *D. macrocercus,* the caudal feathers being however somewhat broader, Three species are quite similar. Length of wing five inches and three eights, of middle tail feathers five inches, the outermost an inch and a half, to an inch and three quarters more; bill to gape an inch and three eighth; and tarse an inch. The form of bill and plumage is as in *E. malabaricus,* the frontal crest being rather more developed than in the next species.

DICRURUS LEUCOPYGIALIS, *Blyth.*

Similar to *D. cœrulescens.* Linn. but smaller; the tip of the upper mandible (it would seem constantly) more produced and the white confined to the lower tail coverts, the abdominal region being merely somewhat paler than the breast. Length of wing five inches and three eighths.

Remarks.—Both these species were sent to Mr. Blyth by Dr. Templeton. We have only seen the former.

GALLUS LAFAYETTEI, *Lesson.*

Remarks.—Mr. Blyth makes *Gallus Stanleyii* of Gray the female of the Ceylon Jungle Cock which has been described, if we mistake not, by *Lesson* under the name of *G. Lafayettei.* Mr. Gray, on the contrary, makes *G. Stanleyii* to be the female of *G. Sonnerattii.* The former was long known in Europe by Gray's published figure of the hen. We remember well Mr. Gray Junior showing us the Ceylon bird (a male specimen) in the British Museum labelled *Gallus Lafayettei,* and its characters corresponded with Lesson's description. Since then we have supplied both the British Museum and Zoological Society of London with male and female of the jungle fowl, and ere this no doubt Mr. Gray and others would have formed their opinion on Mr. Blyth's observations.

GALLO-PERDIX BICALCARATUS. *Blyth.*

Remarks.—Mr. Blyth places the long known *Tetrao-bicalcaratus* (figured in Pennant's work) under his new genus GALLOPERDIX, and says that it is quite distinct from the Cumia Partridge *Perdix benulosa,* vel, *P. Hardwickii* Gray.

This double spurred partridge (The Haban Kookoola, of the Singhalese) is a common bird on the Western Coast of the Island, and we have also obtained fine specimens of it at Newera-Ellia, where also *Gallus Lafayettei* is common.

Seldom are the sexes of *G. Lafayettei* seen together. In travelling along the less frequented high roads the Jungle Cock is frequently seen, but rarely does the hen venture out on such exposed situations; and therefore, are female specimens so rarely obtained. At Trincomalie, a very handsome cock can be bought for six pence, but a hen is rarely seen in the market. Hybrid breeds of the jungle fowl and the domesticated Indian bird (the origin of which is supposed to be *Gallus Bankivus*) are sometimes seen in the villages, but all attempts we have made to domesticate our jungle fowl have failed. The natives are said to succeed, only, when the Birds are hatched by a domestic fowl from eggs procured in the jungles.

PALÆORNIS CALTHROPÆ, *Layard.*

A beautiful species, the representative in the mountainous parts of

Ceylon of *P. Columboides* of the Nilgiris, to which species it manifests the nearest affinity. Crown and back plumbeous-grey, passing to bluish on the rump, and rich dark indigo-blue on the middle tail-feathers and outer webs of the rest: tail yellow beneath and at the tips, sullied along the inner webs of the rectrices above; forehead and cheeks (passing beyond the eye), broad nuchal ring, and entire under parts, brilliant green; wings deeper green paler, and yellowish towards the Scapularis: throat intense black and contrasting with a tendency to form a ring round the neck, but which does not so much as half surround the neck. Upper mandible bright coral, with a white tip, the lower reddish. Wing 5¼ in.: tail probably of its usual length, but its medial feathers in the specimen described appear but half grown. A female or young male is wholly green, more yellowish below; except the rump which is brighter blue than in the adult male, and the tail is mingled green and indigo-blue; the more vived green ring of the neck but obscurely indicated. Both the mandibles are dull coral with white tips; and the wing measures 5¼ in., the tail but 4½ in.

Inhabits the Kandyan country in Ceylon. Nothing can exceed the harmony and delicate beauty of its colouring.

Loriculus Asiaticus; *Psittacus Asiaticus*, Latham, and *Ps: indicus*, Gmelin,—both founded on Edwards pl: 6, which is a good representation. The names, however, are bad, as the race would seem to be wholly confined to Ceylon, while *L. vernalis* inhabits all India, and the countries bordering the Eastern shores of the Bay of Bengal, as far as the Tenasserim provinces where it abounds, and also Java; whereas in the Malayan peninsula there appears only to be *L, galgulus*. *L. Asiaticus* differs from *L. vernalis* in having the crown deep red, passing to a saffron hue on the nape, and in some specimens over much of the back; while the fore part of the neck is tinged, more or less deeply with verditer. The nearest affinity of these Loricules is with the genus Eclectus; and there are other species in the Philippines and probably the South of China.

BUCEROS PICA.

Distinguished by its comparatively large size, highly compressed casque with great black patch not descending upon the upper mandible, and four white tail feathers on each side. Inhabits all the peninsula from Central India Southward and Ceylon?* At least a head from the latter country is undistinguishable; but the Singhalese race (*B. violaceus*, Auct.), is described to have constantly only three of its outer tail feathers on each side white.

BUCEROS VIOLACEUS, *Shaw* and *Wagler*? (Non vidimus) from Ceylon. *B. Malayanus* as also nearly affined, but too different to be confounded with either of the others; and *B. nigrirostris* (No. 182) is certainly distinct, and is referred to by Dr. S. Muller as a permanent variety of *B. Malayanus*.

PICUS GYMNOPTHALMOS,—*Blyth.*

This little Woodpecker so nearly resembles *P. Moluccensis* (No. 301), that the same description of the upper parts would nearly serve for both; but the under parts are *streakless* rufescent white, except the lower tail coverts which have blackish centres. The crown also differs in being of an uniform sooty black, a little brownish towards the lores only; the outer webs of the primaries are wholly dusky-black without markings; and all the tail feathers have series of two or three white spots along the border of each web, not developed into bands. The black generally is also more intense than in *P. Moluccensis*; and there is a small naked orbital space, less developed in *P variegatus*. We have only seen the female, but Mr. Layard informs us that the male has "a slender brilliant crimson ear stripe."

Inhabits Ceylon; where generally observed singly upon dead trees (Layard.)

CUCULUS TENUIROSTRIS,—*Blyth.*

In Lower Bengal, the majority of adults of this species have the lower parts bright ferruginous; on the Eastern side of the Bay of Bengal, all appear to be of this colour, and we have reason to infer that they grade insensibly into the smaller Malayan race (*C. flavus*) as we proceed Southward, and the adults of that race we have never seen otherwise coloured. On the other hand, throughout the peninsula of India and in Ceylon, also in the Deyra Doon, the rufous bellied specimens appear never to occur, and many are wholly dark ashy in Lower Bengal, while others from this vicinity exhibit every intermediate grade having reference neither to age nor sex.

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* We have ascertained that the true B. pica, inhabits Ceylon—found in great abundance near Trincomalie. E. F. K.

CENTROPUS CHLORORHYNCHOS, *Blyth.*

Distinguished from C. RUFIPENNIS, Illiger. (vel *philippensis,* Cuvier No. 385) by its much shorter wings, and larger bill of an uniform greenish-yellow colour; by the darker shade bordering on marronne of the back, and wings; aud by the peculiar hue of the dark head, neck, and under parts, which have a somewhat ruddy tinge, and are glossed with amethystine purple; a redder shine of which is seen likewise to gloss the upper parts: tail purple black. Length about 18 in., of which the tail measures half, its outermost feathers 9½ in. less; wing 6½.; bill to gape 1¾ in.; and its vertical depth fully ¾ in.; tarse 2 in., and long hind-claw about 1 in. Inhabits Ceylon.

BATRACHOSTOMOS MONILIGER, *Layard:*

A little smaller than *B. Javansis* (Horsfield No. 404), which it greatly resembles at the first glance, but differs considerably in the details of its marking. Colour of the upper parts, throat and breast, bright bay or rufous-brown; the latter without spots, except a torque of white spots margined above with black above the breast, and another separating the hue of the breast from that of the abdomen; belly and lower tail coverts contrasting pale isabelline, with similar but smaller spots, and a slight dusky mottling over the flanks: coronal feathers long, the occipital tipped with white, bordered above with black, forming a white nuchal ring almost or quite continuous with the torque below; over the eye a pale rufescent supercilium; and the lengthened and erect loral plumes are tipped with black and whitish at the extreme tip; most of the wing coverts are tipped with a large ovoid pure white spot bordered above with black; the tertiaries are pale and delicately mottled with dusky, each having also a minute terminal black and white spot; and the primaries are black having their outer webs broadly margined with the colour of the back; the scapularies also have small terminal black and white spots, and the uppermost are pale like the tertiaries; tail mottled and obscurely banded, the bands terminating externally in series of whitish spots, successively more developed and distinct on the outer feathers. In form the tail is somewhat peculiar, its lateral halves separating into distinct lobes, whence the closed tail appears furcate. Length about 10 in., of wing 4¾ in. and tail 4¼ in.; its outermost feathers 2¼ in., less. penultimate 1 in. less, and ante-penultimate but ¼ in., less. The uniform rufous brown of the throat and breast crossed by the white torque and bordered below by another, well distinguishes this species from *B. Javanensis*: and the bright white spots on the wings (corresponding but not similar to those of the large *B. auritus*) distinguish it as readily from *B. affinis*. It remains to ascertain whether either *B. moniliger B. affinis*, or *B. auritus*, presents the state of plumage corresponding to that named *Podargus cornutus* by M. Temminck, who considers this to be identical with *B. Javanensis*, while Mr. G. R. Gray regards them as separate species. The dark young specimens of presumed *B. affinis* from Darjiling would seem to indicate, from its considerable resemblance to *Cornutus*, that it would afterwards have assumed that dress, in which case it would seem to follow that the two are different phases of the same bird, irrespective of age and perhaps sex. *B. Moniliger* inhabits Ceylon, where Mr. Layard is informed that it is not uncommon at a particular altitude in the Kandyan country; and it is most probably the Coorg species seen by Mr. Jerdon. as noticed in XIV. 209.

The anatomy of this genus differs remarkably from that of CAPRIMULGUS. The stomach is a highly muscular gizzard like that of *Nyctibius*; and there is a large gall bladder; sternum small, subquadrate with but a slight keel, and four deep emarginations behind; the coracoids long and slender, and furcula like that of Caprimulgus but more slender. According to Mr. Gould the outer front claw of *Podargus* is capable of reversion; but on macerating and completely relaxing the foot of *P. Strigoides*, we found that it can be only half reversed as in *Corythaix*, *Tamatia*, and some other genera. Save in the proportional size of the feet, which are much larger in *Podargus* there seems to be nought else to separate *Batrachostomos* from it;

and it is probable that even in this respect a gradation occurs in the different species.

CISSA PUELLA. *Blyth.*

Size and structure of C. VENATORIUS; the outermost and penultimate tail feathers shorter than in that species. Entire head, neck, and breast, with the outer webs of the primaries, secondaries and tertiaries, bright bay or ferruginous brown; rest of the plumage beautiful deep blue of different shades, except the tips of all the tail-feathers which are white bordered about with black, the middle pair with only a trace of this; inner webs of the primaries and secondaries black, empurpled except on the primaries, anterior half of the wing deep indigo-blue; the back tail, except the tips and a band across the breast, smalt blue; lower parts dull bluish grey. Such are the colours of what is evidently a bird in its first plumage. The beak looks as if it would probably have become deep coral-red; and the feet are pale with dusky claws. Bill to gape 1. 9-16 inches, wing 6¼ inches, middle tail feathers 8 inches, the outermost 2¾ inches, and the rest evenly graduating.

This beautiful species inhabits Ceylon.

DRYMOICA VALIDA, (*Robusta*) *Blyth.*

Differs from *D. Sylvatica* of the Nilgiris in its darker shade of colour above, and larger and stronger bill and legs, which last appear to have been of a deep reddish brown colour; the flanks and sides of the breast are duskyish.

HIRUNDO HYPERYTHRA, *Layard*

Resembles *H. daurica*, but has the entire under parts (inclusive of ear coverts) of the same deep ferruginous hue as the rump, which is deeper than that of *H. daurica*; the mesial streaks of the feathers of the lower parts being less developed. Accordingly, this species bears exactly the same relationship to *H. daurica*, which *H. cahirica* does to *H. rustica*, and has the same claim for separation.

It appears to be peculiar to the Island of Ceylon, where Mr. Layard informs us that "it builds in the houses of Newera-Ellia and does not migrate." A remarkable contrast to the habits of *H. daurica*; while it curiously resembles in its stationary abode the *H. cahirica*.

Remarks.—We have never seen this Swallow at Newera-Ellia. The swallow which builds its nest in roofs of houses on that station, is *Hirundo domicola*, of Jerdon. *H. Hyperythra* is found in great abundance at Kandy and Kaduganava Pass.

ALCIPPE NIGRIFRONS, *Blyth.*

Closely affined to *A. atriceps* (Jerdon), from which it differs in not having the whole crown black, but only the forehead continued as a line backward over each eye, and the ear coverts. The tail is also darker and distinctly rayed with dusky black. General hue fulvous-brown above, and on the flanks and lower tail coverts: rest of the under parts pure white, the axillaries tinged with rufescent. Wing 2¼ inches.

Inhabits Ceylon.

DRYMOCATAPHUS FUSCOCAPILLUS, *Blyth.*

Like *Dr. nigrocapitatus*, but the supercilia uniform with the lores, ear-coverts, sides of neck, throat and entire under parts, pale ferruginous brown, a little deeper on the breast: coronal feathers dark-brown margined with dusky black, and pale shafted: rest of the upper parts uniform greyish olive brown, the primaries margined paler, and the extreme tips of the tail feathers rufescent. Bill pale, the upper mandible dusky: and feet pale. Length about 6¼ inches, the wing 2⅞ inches; and tail 2½ inches; bill to gape 13-16th inches; and tarse 1 inch.

Inhabits Ceylon.

ACROCEPHALUS DUMETORUM, *nobis:* Syn: Acr. montana of India, auctorum. "*Calamoherpe montana* of India," writes Mr. Strickland, "is not Horsfield's *montana*, in which the wing is 2 inches long, graduated; the fifth quill longest."

LEUCOCERCA COMPRESSIROSTRIS, *Blyth.*

Like *L. albofrontata*, but with the bill much more compressed. Perhaps a variety only. From Ceylon.

C. DICRURUS MACROCERCUS. var.

The Singhalese representative of this species appears to be invariably much smaller than the race of all India, adults having the wing but 5 to 5¼ inches (instead of 6 inches), and the rest in proportion. *D. longicaudatus* of Ceylon differs in no respect from the common Indian bird; but *D. cærulescens* of India is replaced in Ceylon by the nearly affined *D. leucopygialis;* and a very distinct species exists in the Island, the *D. edoliformis* which is in fact without the racket tail, its tail quite resembling that of *D. macrocercus.*

RALLUS INDICUS, *Blyth.*

Resembles *R. aquaticus*, but averages a rather larger size, having the wing 5 to 5¼ inches, and the bill is constantly more robust. Of many dozens of specimens, we have never once seen the pure ashy hue of the under parts so common in *R. aquaticus,* there being always an intermixture of brown, common in L. Bengal and in India generally.

PELICANUS JAVANICUS (?) *Horsfield.* No.1742 *P. Philippensis,* Gmelin, described Ann: Mag. N. H. XIV, 122. These two species of Pelican are common throughout S. E. Asia and its islands, and we believe are here correctly identified. The first closely resembles *P. onocratalus,* but has never the full and copious pendent occipital crest of slender feathers, about 5 inches long, which distinguishes *P. onocratalus* at least in the breeding season; the head and neck plumage being of quite a different character, not silky and fur like and the feathers undistinguishable apart as in *P. onocratalus,* but open, flimsy and downy, and curving round towards the occiput,—characters which are more strikingly developed in *P. Philippensis.*

CAPRIMULGUS KELAARTI, *Blyth,* n. s.

Both sexes of a species much resembling *C. Indicus;* Latham, but smaller, and identical with the Nilgiri bird described in a note to J. A. S. XIV, 208: and the large specimen referred to on the same occasion, which we have now much reason to believe was either from the Philippines or China, * is doubtless also of a distinct race; the three differing much as *C. Albonotatus, C. Macrourus* and *C. Atripennis,* or *C. Ruficollis* and *C. Indicus, C. Monticolus* and *C. Affinis.*

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* It formed part of the dispersed Macoa Museum.

These three species or races much resemble *C. Europæus* in their general aspect, but have plumed tarsi, and the males are marked with white on *four* of the outer tail-feathers on each side, and on the same number of the wing-primaries. The white on the tail-feathers is not quite terminal, as in *C. Europæus*, but has a narrow dark margin in *C. Indicus* and *C. Kelaarti*, and a much broader dark margin in the other, reducing the space occupied by the white in the first two races: and the *ensemble* of the markings of *C. Kelaarti* presents a certain difference from that of *C. Indicus*, readily enough appreciable by the eye, but which can scarcely be expressed adequately in language; further than that the pale portion of the plumage generally is more albescent and less tinged with rufous in *C. Kelaarti*, and thus contrasts more strongly with the black. The size, however, affords the readiest distinction, the length of wing in three specimens of *C. Kelaarti* ranging from 6⅞ to 7⅛ inches, in five of *C. Indicus* from 7⅜ to 7⅞ inches, and in one of the Chinese (?) race 8½ inches.†

CISSA PUELLA, *Blyth*, J. A. S. XVIII, 810;

C. *pyrrhocyanea*, (Wagler,) Gould's Birds of Asia, pt. 1. "This" writes Dr. Kelaart, "is perhaps the handsomest bird in Ceylon. It is rather numerous about Newera-Ellia, but I have not seen it in the low country."

GARULAX CINEREIFRONS, *Kelaart*. n. s.

Affined to G. Delesserti, (Jerdon, *Ill. Ind. Orn.* pl. 13), of the Nilgiris, but differing much in its colouring. General hue a rich brown above, much paler below; forehead and cheeks pure ashy; chin and borders of the outer primaries, albescent. Bill blackish. Legs dusky corneous. Length 8½ inches; of wing 4½ inches; and tail 4 inches; its outermost feathers 1⅛ inch less: bill to gape 1¼ inch: tarse 1¼ inch.

ALCIPPE NIGRIFRONS, *Blyth*, J. A. S. XVIII. 815.

Young, similar in plumage to the adult.

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† Among numerous examples of C. Indicus procured in Bengal and various other parts of India, the Malayan Peninsula &c., we have observed no difference worthy of notice here.

CISTICOLA OMALURA, *Blyth.*

Differs from *C. Cursitans*, (Franklin) in having a stouter bill, the whole upper parts much darker, and the tail sub-even, except that its outermost feathers are ¼ inch shorter than the next. The prevailing hue of the upper parts is dusky-black, with much narrower rufescent lateral margins to the feathers than in *C. Cursitans*, the rump however being unmixed rufescent as in that species, and the neck much tinged with the same. One specimen has some dark markings on the breast; and another in first plumage greatly resembles the adults, and is conspicuously different from the young of *C. Cursitans*. This species was long ago procured by Mr. Layard, and therefore is probably not peculiar to the mountains or their vicinity. From the whole of India we have only seen *C. Cursitans*, which likewise inhabits Ceylon. Numerous African species of this genus have however been figured and described by Dr. Ruppel and Dr. Andrew Smith, and five Australian Species by Mr. Gould (whose C. Ruficeps we take to be merely the young of his *C. Isura.*) From *Drymoica* they differ structurally in having twelve tail-feathers instead of ten only.

MERULA WARDII, *Jerdon.*

Both sexes of this species are sent, the female being the *Oreocincla micropus* of Mr. Hodgson.

MERULA KINNISII, *Kelaart*, n. s.

The blackbird of Newera-Ellia. Female, above ashy-black, below rather paler; bill and feet bright yellow. Length about 9 inches; of wing 4½ inches; and tail 4 inches; bill to gape 1⅛ inch; and tarse the same. 1st short primary 1¼ shorter and 2d, ½ inch shorter than the fourth. The last character distinguishes this species readily from *M. Simillima* and *M. Nigropileus* of S. India; as also from *M. Brachypus*, nobis (J. A. S. xvi. 148), likewise of S. India, but which appears to be Latham's 'Black crowned Thrush," from Ceylon. The wings are even more rounded than in *M. Vulgaris*; and the species would seem to be closely affined to *M. Xanthoscelis*, (Jardine, *Contrib. Orn.*,) from Tobago. "The male," writes Dr. Kelaart, "is blacker and more glossy. In notes and habits resembling M. Vulgaris."

PRATINCOLA ATRATA, *Kelaart*, n. s.

The 'Robin' of Newera-Ellia. Both sexes similar to those of *Pr. Caprata*, except that they are much larger, with a proportionally rather stouter bill; and the female is much less rufescent. Wing 3¼ inches in the male; 3 inches in the female. *Pr. Caprata* inhabits the less elevated parts of the Island.

HIRUNDO DOMICOLA, *Jerdon*.

H. javanica apud Latham and Shaw. 'Bungalow Swallow' of residents in the Nilgiris.

MUNIA PECTORALIS, (*? Jerdon*), adult.

This species was once only obtained by Mr. Jerdon in S. India, and his specimen (which is in the Society's Museum) would now seem to be a young bird. What appears to be the adult is brown above, with pale stems to the feathers, nearly obsolete in the back; and passing to blackish on the forehead, wings rump and tail: throat and foreneck, with the cheeks, deep brown black: the smaller upper tail-coverts are variegated with white, and the longer are largely tipped with fulvous; under parts variegated; the breast brown, and belly and lower tail coverts black, the last having white medial streaks, and the rest of the under-part white subterminal bands, and the flank-feathers a second and some of them a third white cross-band additionally. Beak livid bluish; and feet dark plumbeous. Length of wing 2.3-16 inches; tail 1¾ in.; beak from frontal angle 9-16 inch.

PYCNONOTUS PENICILLATUS, *Kelaart*, n. s.

Yellow-eared Bulbul (?) Jerdon, *Madras Jour.* XIII, 168. Bright olive green above, yellow below: crown and cheeks black, passing to pure ashy on the ear-coverts; the chin, feathers at the angle of the lower mandible and somewhat elongated loral tuft pointing upwards, white; above the eye, also, a white spot, and below it a yellow one,—and proceeding backward from the eye, above, is a lengthened tuft of bright yellow, silky, pointed feathers: no white marks on the tail. Bill black; and feet blackish. Length about 7 inches; of wing 3¼ inches, and tail 3 inches; bill to gape 13-16 inch; and tarse ⅞ inch. Peculiar to the mountain region.

BRACHYPTERYX (?) PALLISERI, *Kelaart*, n. s.

Female? A rich dark olive or somewhat tawny brown above, paler below, and whitish along the middle of the abdomen; flanks and lower tail-coverts dark; and a strong rufous tinge on the chin and throat. Bill dusky above, whitish beneath. Feet brown. Length about 6⅛ inches, of wing 2⅛ inches, and tail 2¾ inches, bill to gape 13-16 inches; tarse 1 inch. The 5th, 6th and 7th primaries equal and longest, the 1st one inch shorter; and the outermost tail feather 1⅜ inch shorter than the middle ones.

PALUMBUS ELPHINSTONEI (?, *Sykes*), var?

This bird is so closely affined to the Nilgiri race, that we do not venture to separate it, however strongly distinguished in its colouring; quite as much so, for instance, as *Turtur Risorius* (*verus*), *T. vinaceus*, and *T. bitorquatus*, or *T. Orientalis* and *T. auritus*. It differs from the Nilgiri race in having the back and wings plain dark slaty, without a trace of ruddy margining to the feathers; the head neck and under parts are also tinged with vinaceous more than with green, and the reddish-purple gloss—especially about the lower part of the neck behind, where it contrasts *abruptly* with the ashy of the back,—is considerably more brilliant. It is altogether a handsomer bird than that of the Nilgiris. "The habits of this Pigeon," writes Dr. Kelaart, "are strictly arboreal; it flies high and swiftly. It comes to Newera-Ellia to breed, and I have seen a nest with only one egg, as large as that of the domestic pigeon. The stomach contained fruits of the *Nelon*." (?) "Sexes nearly alike."

Remarks.—This beautiful pigeon we have named after Lady Torrington—*P. Torringtonii*. It is easily distinguished from all others in the Island, from its large size and black crescentic shaped collar, edged and spotted with white.

NOTES.

While this work is going through the press Mr. Blyth informs us that the Bat which we have named *Scrotophilus Ceylonicus* has the dentition of *Vespertilio adversus.* He also makes *Rhinolophus rubidus* to be a variety of *R. affinis*? Horsf. Mr. Blyth is inclined to make *Hipposideros fulgens* of Elliot only a variety of *H. murinus.* If colours so strongly contrasting as dark brown and bright yellow are not found sufficient to make species, we shall have to reduce considerably the number of Indian bats.

It appears that we have sent Mr. Blyth *Megaderma spasma,* (*verus*) Geoff, which must now be added to the List of Mammals of Ceylon. It is thus described. "Leaf heart-shaped; follicle large and similar: auricle of a half heart shape."

Mr. Blyth forms a *new species* of the small mouse which we have cited doubtfully as a variety of *Mus cervicolor*. Mr. Blyth names it *Mus fulvidiventris.* We have also recently procured specimens of *Mus musculus* (verus) from Kandy and Trincomalie.

Mr. J. E. Gray in his latest Synopsis of the Deer tribe (Annals and Mag. of Nat. Hist. May 1852.) makes the Rusa of Ceylon and India a distinct species from those of Java and Sumatra, and calls it *Rusa Aristotelis,* restricting the specific name of *Equinus* to the Rusa of Sumatra and Borneo, and *Hippelaphus* to the Rusa of Java.

As we are so far from a Museum of Ceylon Mammals, and it is not easy to procure fresh specimens, we must reserve some other notes on recent researches of M. Blyth and Mr. Gray for another opportunity.

MR. BLYTH'S REPORT

ON

CEYLON MAMMALS, BIRDS, REPTILES AND FISHES;

March 1852.

From Dr. Kelaart of the Ceylon Medical Service, several packages have been received, which have greatly enriched our collections.

Of mammalia, we are indebted to him for skins, skulls, &c. of PRESBYTIS PRIAMUS, and skins of PR. URSINUS (*J. A. S.* XX, 155), young, and skin of PR. CEPHALOPTERUS, almost white (*Pr. albinus* Kelaart, *J. A. S.* XX, 182); LEMUR CATTA, L,; and numerous specimens of Bats, as follows:—

PTEROPUS EDULIS, *v. Edwardsii*, &c.

PT. LESCHENAULTII, DESM., v. *Pt. seminudus*, Kelaart. A fine pair in spirit, a skin, and specimen now prepared as a skeleton.

CYNOPTERUS MARGINATUS, (B. Ham.) Some ordinary brown examples in spirit, and a skin with the neck and sides of a very deep ferruginous hue, in which phase this species is the *C. Horsfieldii* of Mr. Gray. In old Bengal specimens, the same parts become deeply tinged with bright tawny or rufo-fulvous, but are never dark ferruginous, so far as we have seen. * Malayan examples are of a paler and more uniform brown, and constitute the *C. titthæcheilus*, (Tem.), &c. &c.; † exhibiting no further difference whatever that we can perceive, notwithstanding the remarks of Dr. Horsfield in his recently published catalogue of the specimens of mammalia in the Hon'ble Company's Museum in London.

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* Since writing the above, we have obtained a fresh Calcutta specimen, which at first was very nearly as deeply tinged with ferruginous as the example from Ceylon; but, in drying, the colour has faded very considerably.

† Vide *J. A: S.* XV, 187. *Lemur Catta* from Madagascar. E. F. K.

Nycticejus Temminckii. (Horsfield, nec Ruppell, *Atlas*), v. *Belangeri, castanea,* et *noctulinia,* auct. Two specimens, one paler than the other on the upper parts. By exposure to the light, the fur of this species fades and becomes much more rufous or rufo-fulvous; and in all Indian specimens that we have seen, the under-parts are constantly much paler than the upper: but in one Javanese example in the Society's collection, the upper parts are of a much more vivid tawny-rufous or ferruginous colour than we have seen in any Indian specimen, and the under-parts are scarcely fainter in hue, We consider this to be a casual variety only, analogous to those of certain Horse-shoe and various other Bats mentioned in the sequel.* *N. B.* Although in the recent state, this very common Indian species is most easy to distinguish from N. luteus, nobis (*J. A. S.* XX, 157), from the considerable difference of colour, however either may vary, they both fade and alter so much in colour by exposure to light that they then appear like larger and smaller races of the same species,—the under parts of M. luteus, however, becoming generally of a more rufescent hue than those of ordinary N. Temminckii. The length of fore-arm in N. Temminckii is very regularly 2 in., in N. luteus 2⅜ in., and in N. Heathii 2¾ in. Examples of N. Heathii from Ceylon appear to be constantly a good deal darker than those from S. India, unless perhaps from the more proximate districts of the continent.

Scotophilus coromandelianus, (F. Cuv.)

Vespertilio adversus (?), Horsf. Rather darker than a Calcutta specimen referred to the same, which latter entirely resembles an example procured at Penang.

Kerivoula picta. (Pallas).

Megaderma spasma, Geoffroy. A skin and entire specimen in spirit. Identical in species with examples from Malacca and Java.

Rhinolophus affinis (?), Horsfield: *Rh. rubidus* et *fulvidus,* Kelaart, as also another supposed species referred to by the same gentleman in *J. A. S.* XX, 182-3; perhaps, too, the doubtfully cited *Rh. pusillus* from Ceylon of Mr. Waterhouse's catalogue of the mammalia in the Zoological Society's museum: but, it would seem, not RH. AFFINIS of Dr. Cantor's Catalogue of the mammalia inhabiting the Malayan peninsula (*J. A. S.* XV, 181). An extensive series of specimens, both in spirit and skins; and varying in hue from the most vivid rufo-ferruginous in both sexes, to dusky-brown paler below and without a shade of ferruginous or fulvous in either sex,— others again being intermediate,—and the adolescent example is dingy cinereous above, with here and there a slight admixture of rufous, and below chiefly of the latter hue. In structure there is no diversity whatever, and those of various colours were taken in company. The admeasurements of a full grown male are as follow. Length of head and body 2¼ in.; of tail (additional) 1 in.; alar expanse 10½in.; forearm 1⅞ in.; tibia ⅞ in.; ear-conch (posteriorly) barely ⅝ in. Facial appendages typical. Fur of mean length, somewhat dense, porrect, sinuous. A minute pair of upper incisors, liable to be overlooked in the fresh specimen.

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* A similar Javanese specimen is noted in Mr. Gray's Catalogue of the specimens of mammalia in the British Museum.

HIPPOSIDEROS NOBILIS (?), Horsfield: *Rhinolophus armiger.* Hodgson; *H. lankadiva,* Kelaart, vide *J. A. S.* XX, 103. Male and female in spirit; another specimen now set up as a skeleton; and a skin. Decidedly identical in species with Mr. Hodgson's *armiger,* and so far as can be judged from the figures and descriptions, also with the Malayan H. NOBILIS.

H. SPEORIS, (Schneider). Vide. *J. A. S.* XIII, 489. Numerous specimens in spirit and also skins. It is remarkable that some examples of this species, also, are very bright rufo-ferruginous or golden-fulvous, others fulvous brown more or less dark, and others again brown or slaty without a tinge of fulvous,—the ordinary colour (that heretofore described) however predominating, and, in general it would seem that the brown Ceylon specimens run darker than those of S. India. Moreover, it would seem that the vivid rufous examples both of this and other species are comparatively rare, though from being particularly selected out of multitudes they may accumulate in collections.

H. MURINUS, (Elliot): of which there now can be no further doubt that *Rhinolophus fulgens*, Elliot, v. *H. fulvus*, Gray is merely the corresponding vivid rufous phase to those noticed of H. SPEORIS and of the RHINOLOPHUS. Four specimens, all of a blackish tint, thus illustrating the *H. ater* of Dr. Templeton, and indicating that in the present species (as in the preceding) Ceylon examples run darker than those of S. India. *

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* The observation of these varieties of colour in different Horse-shoe as well as in other genera of Bats shews that colour has been too much regarded in the attempt to discriminate the species of these animals: It is a variation that has long been known in some of the RHINOLOPHI, and M. Geoffroy St. Hilaire was of opinion that the rufous hue becomes more intense in proportion as these animals inhabit nearer the equator. Indeed, this would seem generally to be the case, though the Australian RH. AURANTIACUS of Mr. Gray is stated to rival in the vivid intensity of its colouring the 'Cocks of the rock' (RUPICOLA). Numerous examples of the variation in question may here be conveniently adduced.

RHINOLOPHUS LUCTUS, Tem. (Apparently identical with *Rh. perniger*, Hodgson, inhabiting the S. E. Himalaya and the Khaspa hills.) Rufous variety, from Manilla, described by MM. Eydoux and Gervais in the Zoology of the voyage of 'la Favorite.' Perhaps also Mr. Gray's *Rh. morio* from Singapore, the fur described as "reddish brown;" yet in Mr. Gray's catalogue of the specimens of mammalia in the British Museum, he terms this "the Black Horse-shoe Bat," a name suitable enough for ordinary RH. LUCTUS.

RH. MINOR (?), Horsfield. The *Rh. lepidus*, nobis, from Bengal, Masuri, &c., would appear to exemplify the ordinary phase of what we now take to be this species, and *Rh. subbadius*, Hodgson, to represent the rufous phase. At least *Rh. lepidus* and *Rh. subbadius* prove to differ only in colour, and both seem to be referable to RH. MINOR. (Since writing the above, we have observed that Mr. Hodgson assigns his SUBBADIUS to HIPPOSIDEROS in *J. A. S.* XVI, 896; but the specimens which he sent to the Society by that specific name are genuine RHINOLOPHI.)

RH. MACROTIS, Hodgson. Of this sub-Himalayan species we have both brown and light rufous examples.

RH. AURANTIACUS, Gray. The description of this Australian species is not at hand; but we may suggest that it probably is merely a rufous variety of RH. MEGAPHYLLUS.

HIPPOSIDEROS DIADEMA, (Geoff.) Vide Cantor, in *J. A. S.* XV, 182.

H. LARVATUS, (Horsfield), the rufour phase,—and *Rhinolophus vulgaris*, Horsf., the dark phase. The Arakan species described under these names in *J. A. S.* XIII, 488, appears on present evidence to be correctly assigned.

Taphozous fulvidus, nobis, *J. A. S.* X, 275, is merely a fulvescent phase of T. LONGIMANUS. (*T. brevicaudus*, nobis, also, was founded on a specimen of T. LONGIMANUS distorted by the stuffer; and as *T. crassus*, nobis, proves to be identical

Of *Carnivora*, three species of Mungouste are sent, viz. MUNGOS VITTICOLLIS, (Bennet), injured;—HERPESTES RUBIGINOSUS, Kelaart, v. *Ellioti*, nobis, vide *J. A. S.* XX, 162, 184;—and H. FULVESCENS et *flavidens*, *loc. cit.* Of the two latter, H. RUBIGINOSUS is affined to H. NYULA, Hodgson, in size and the character of its fur, but the rufous ground-tint predominates, the tail-tip is black and the four paws are blackish; and H. FULVESCENS is similarly affined to H. GRISEUS, but is of a much deeper colour, a deep fulvous or tawny predominating, and the coat is more dense, though by no means so full and so developed upon the tail as in H. FUSCUS, Waterhouse, of the Nilgiris. The name *flavidens* is objectionable as being quite unfounded, and we therefore substitute for it the other appellation by which it has also been described. *

LUTRA NAIR, F. Cuv. Specimen procured at an elevation of 4,500 ft., near Newera Ellia.

URSUS LABIATUS. Skull of an old female.

SOREX. Two species of typical Shrew, one the S. FERRUGINEUS,

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with T. SACCOLAIMUS Tem. v. *pulcher*, Elliot, and as we further are not now satisfied of the distinctness of *T. Cantori*, nobis, from T. LONGIMANUS, the Indian TAPHOZOI would accordingly be reduced to T. SACCOLAIMUS, Tem., T. MELANOPOGON, Tem., and T. LONGIMANUS, (Hardwicke),—all three inhabiting the peninsula of India as well as the countries to the E, and S. E.

NYCTICEJUS TEMMINCKII, (Horfs.), exhibits occasionally an uniform bright tawney-rufous phase of colouring (in the Malay countries only, so far as observed), which has already been remarked in the text.

NYCTICEJUS (small undetermined species, common about Calcutta). The writer once shot a specimen, now in the Society's museum, with patches of bright goldenfulvous on the lower-parts.

CYNOPTERUS MARGINATUS, (B. Ham). Vide text.

Analogous variations occur in sundry birds, which exhibit an occasional rufous or tawney phase of colouring; *e. g.* various CUCULI.—certain Owls (especially the small Indian SCOPS, of which the grey phase was named *Sc pennata* and the rufous phase *Sc. sunia* by Mr. Hodgson),—some of the Asiatic PODAGRI (v. *Batrachostomi*) *J. A. S.* XVIII, 806, &c.

* The determination of the above species of Mungouste necessitated a more elaborate study of the various Indian species of the group than we had previously the opportunity of bestowing; and the following are the results arrived at, from the series of specimens now in the Society's museum, among which we discriminate the following:—

Kelaart, *J. A. S.* XX, 185,* (perhaps *S. niger*, Elliot, of Horsfield's Catalogue?): the other sent as the "large godown Shrew of Kandy," and according pretty well with Schinz's description of S. SERPENTARIUS, Belanger. Length of head and body about 4¾ in.; tail 2⅛ in.; tarse to end of claws 13-16 in.; skull 1 3-16 in. Colour dusky slate, with rufescent tips to the fur of the upper-parts; beneath the fur is

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1. URVA CANCRIVORA, Hodgson. Hab. Nepal; Arakan; Afghanistan (Griffith).

2. MUNGOS VITTICOLLIS, (Bennet). Hab. Malabar; Ceylon. (*N. B.* Barely separable, generically, from the last, although the bony orbital rings are complete in adults—as in the following species, with the exception of H. BRACHYURUS which is about equally worthy of separation. The black lateral neck-band in the present species is represented by a white one in the preceding)

3. HERPESTES RUBIGINOSUS, Kelaart; *H. Ellioti*, nobis. Hab. S. India; Ceylon.

4. M. MALACCENSIS (?), Fisher: *H. nyu'a*, Hodgson: *H. griseus* apud nos, passim. Hab. Bengal; Nepal; Arakan? Malayan peninsula? We possess a fine mounted albino of this species, referred to H. GRISEUS in *J. A. S.* XV, 250.

5. H. GRISEUS, (Geoffroy). *Viverra mungo*, L., et *H. pallidus*, Schinz, apud Horsfield. Hab. Hindustan; S. India; Ceylon? *N. B.* Resembles the last in size and form, and H. NIPALENSIS in the character of its fur.

6. H. FULVESCENS, v. *flavidens*, Kelaart. Hab. Ceylon; S. India?

7. H. NIPALENSIS et *auropunctatus*, Hodgson. Hab. Bengal; Upper India generally; Sindh; Afghanistan; Malayan peninsula (Cantor). *N, B.* Varies much in general cast of colour, ashy or fulvous prevailing, some also being very pale, others dark.

8. H. JAVANICUS, (Geoff.) Hab. Malayan peninsula and archipelago, ascending northward to Chittagong. *N. B.* Does not seem to differ from the last except in colour.

9. H. FUSCUS, Waterhouse. Hab. Nilgiris.

10. H. (?) BRACHYURUS, Gray. Hab. Malayan peninsula. *Remark.** The only two species of Mungouste inhabiting Bengal are H. MALACCENSIS (*nyula*) and H. NIPALENSIS.

* Of two specimens of this Shrew sent formerly by Dr. Kelaart, one was labelled S. MONTANUS by mistake, and we thus came to describe both by the name MONTANUS in *J. A. S.* XX, 163, dropping the name species in XX. 185. He now writes word that he agrees in considering the two specimens referred to as being of one species, his S. FERRUGINEUS; whilst his S. MONTANUS has never been sent here at all, his only specimen having been forwarded to Dr. Andrew Smith in England.

shorter and more appressed, and somewhat paler, with a faint tinge of rufous about the breast. Not improbably undescribed, and quite distinct from the two other Ceylon Shrews described *J. A. S.* XX, 163.

SCIURUS. Of this genus, Dr. Kelaart has only sent a fragment of the skin of a young Sc. MACROURUS, Forster (var. of a ruddy-white or whitish-isabelline colour); and, on loan, a skin of the rufous-capped Striped Squirrel, Sc. KELAARTI, Layard (vide note to *J. A. S.* XX, 166), remarkable for having its three pale dorsal stripes unusually clear whitish, the five dark stripes unusually blackish and strongly contrasting, the medial whitish stripe narrow and the lateral broad, and the crown but faintly tinged with fulvous. Neither this nor Sc. BRODIEI are very satisfactorily distinguished from Sc. TRISTRIATUS, of which they seem to be local varieties merely; all retaining the deep rufous tinge under the tail by which they may be at once distinguished from Sc. PALMARUM, and it remains to ascertain whether the *voice* severally differs, as is so remarkably exemplified by Sc. PALMARUM and Sc. TRISTRIATUS.*

The MURIDÆ sent are—GERBILLUS INDICUS, skin and examples in spirit.—MUS INDICUS, Geoffroy in spirit,—M. FLAVESCENS, Gray, and its var. *kandianus*, Kelaart, *J. A. S.* XX, 169, several specimens in spirit, confirming the opinion expressed *loc. cit.* of the non-distinctness of this as a species from M. FLAVESCENS,—M. NEMORALIS (?), nobis; adolescent? (this is sent as "the common house Rat of Trincomali and Batticaloa; I never," adds Dr. Kelaart, "saw it elsewhere"): M. MUSCULUS, L., from Kandy, skin, and specimen in spirit (the first instance we have seen of the common European house Mouse from any part of Asia, though of course it must be continually brought by the shipping),—and, lastly,—

MUS FULVIDIVENTRIS, nobis, *n. s.* A field Mouse from Trincomali, affined to M. TERRICOLOR, nobis, *J. A. S.* XX, 172, and to another we have since discovered in the neighbourhood of Calcutta.[*] Length probably about 2¾ in.; tail (vertebræ) 2½ in.; tarse to tip of claws ⅝ in. Colour of M. SYLVATICUS above, the fur shorter and less fine, and straight (as in the various Indian affines); lower-parts rufescent or isabelline, or they may be described as pale weak ferruginous. Twenty caudal vertebræ distinguishable with ¼ in. additional of tail-tip.

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* In a communication just received from Mr. Layard, it seems that he also is now of opinion that Sc. BRODIEI and Sc. KELAARTI may be varieties of Sc. TRISTRIATUS; but in *Ann. Mag. N. H.*, 1852, p. 335, he states of Sc. BRODIEI that its voice is far more shrill than that of Sc. TRISTRIATUS; and also of Sc. LAYARDI, nobis, that—"I shot it in dense jungle, being attracted to it by the *voice*:" but the last is undoubtedly a strongly marked distinct species.

HYSTRIX HIRSUTIROSTRIS, Brandt: *H. leucurus*, Sykes; *H. zeylonensis*, nobis (the young). Skins and skulls.

SUS——? Three skulls of wild Boars of different ages from Trincomali do not present the peculiarities of form of the skull sent by Mr. Layard, upon which is founded the SUS ZEYLONENSIS, nobis, *J. A. S.* XX, 173; but are nearly affined to the continental race with narrow occiput, this part, however, being rather less narrow than in the Indian specimen described *loc. cit.*

MANIS PENTADACTYLA, L.: *M. brachyura*, Erxl., &c. The skin of a full grown specimen, establishing this species as an inhabitant of the island.

Of Birds, the most remarkable is a new species of CIRCAETUS or HÆMATORNIS, Vigors, forwarded also by M. Layard.

H. SPILOGASTER, nobis, *n, s.* Rather smaller than H. CHEELA, (Lath., v. *undulatus*, Vigors), and remarkable for having the underparts as in the adult of that species, while the upper-parts, throat and tail, retain in the adult the same colouring as that of the young of H. CHEELA; a phase of plumage which we have never seen among the multitude of Bengal specimens of H. CHEELA examined, but which is exhibited in the two now received from different parts of Ceylon. A figure of a third specimen is given in a collection of zoological drawings from Ceylon forwarded on inspection by Mr. J. N. Mooyaart. In this the irides are represented *pure white* (as in POLIORNIS TEESA), whereas those of H. CHEELA are *brilliant golden-yellow.*

SPIZAETUS LIMNAETUS, (Horsf.) var. CIRRHATUS et *cristatellus*, auct., of peninsular India generally, Specimen rather small.

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[*] M. ALBIDIVENTRIS, nobis, *n s.* Resembles M. TERRICOLOR, nobis, except in being much larger, and generally greyer or less fulvescent. Length of a large male (fresh) 6¼ in., of which the tail is 2¾ in.; tarse to tip of claws 11-16 in.; ear (from anterior base) 9-16 in.

Bucbros Pica, Scopoli. The common Pied Hornbill of Ceylon; sent also by Mr. Layard. Identical with Indian specimens: and we therefore consider *B. violaceus*, Shaw, apud Wagler (with four black medial tail-feathers) to be merely a casual variety, more especially as we have seen continental examples with the sub-medial rectrices partly black.

B. gingalensis, Shaw. Head of male.

Cuculus Sonneratii, Latham.

Malacocercus griseus, (Lath.), var. Resembling the species of S. India, excepting that the head is concolorous with the rest of the upper-parts.

Graucolus javensis (? Horsfield). Sent also by Mr. Layard. Differs from Gr. Macei of continental India in its considerably smaller size, the wing measuring but 5½ in., with the rest in proportion.

Gallus Stanleyi, Gray. A fine hen. We had previously only a pullet of this sex.

Dromas ardeola, Payk. in immature plumage. An extremely interesting specimen, as distinctly indicating the affinities of this (as hitherto considered) anomalous and isolated genus. The plumage is precisely that of a young Tern: and from all the details of outward structure, it will be seen that this curious form is but an extraordinary modification of the Tern type, just as Phœnicopterus is a most singular modification of the type of Anserinæ. But the Gulls and Terns, or Laridæ, are more nearly affined in their whole organization* to the great series of Charadriadæ and Scolopacidæ, auct., than they are to the true Palmipedes; and indeed approximate the Charadriadæ, &c., much more than the latter do to either the Ardeidæ or Rallidæ: and therefore they claim to rank rather among the Grallatores than among the Natatores, though the genus Dromas alone assumes the characteristic proportions of an ordinary wader. It will be remarked that the habits of Dromas are entirely those of a sea-side Tern: and an egg formerly sent by Mr. Layard as most probably appertaining to this species (and it could not well have belonged to ought else) is further confirmatory of the view here taken of the position of this remarkable genus in the natural system.*

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* Also by the number and colouring of the eggs, character of the chick, and by the seasonal changes of colouring of the genus Hydrochelikon in particular: by the voice likewise; and by their haunts and general habits.

PORZANA ZEYLANICA, (Gm.) Differs from a specimen from Gumsur in the deep rufous colour being more developed at the base of the nape, and also margining the scapularies, wing-coverts, and longest tail-coverts, where no trace of it is perceptible in the Gumsur specimen. The latter would seem to be of a distinct variety, if not closely affined species.

A few other specimens in this class require no special notice.

Of Reptiles, Dr. Kelaart has forwarded—

TESTUDINATA. EMYS SEBA, Gray (sent also by Mr. Layard),—and EMYDA PUNCTATA, Gray, (v. *Cryptopus granosus*, Dumeril and Bibron).

SAURIA. CROCODILUS PALUSTRIS, Lesson;—MONITOR DRACÆNA, (L.), (v. *Varanus bengalensis*, D. and B.)! †—HEMIDACTYLUS FRÆNATUS, Schl.; H. COCTÆI, D. and B. (common in Bengal, but not hitherto observed in S. India); H. LESCHENAULTII, D. and B.;—LYRIOCEPHALUS SCUTATUS, (L.), 5 adults; CALOTES OPHIOMACHUS (Merrem); C. VERSICOLOR, (Daud.):—C. ROUXI (?), Dumeril and Bibron, C. MYSTACEUS, Dumeril and Bibron, were sent formerly by Mr. Layard.

BATRACHIA. RANA CUTIPORA. D. and B.; R. MALABARICA, auct.; R. BENGALENSIS, Gray; ENGYSTOMA MARMORATUM; POLYPEDATES LEUCOMYSTAX, (Grav.); P. CRUCIGER, nobis, *n, s.*: BUFO MELANOSTICTUS, Schneider.

CALOTES OPHIOMACHUS. Specifically identical with an example from the Nicobars, noticed *J A. S.* XV, 376:* but a nearly affined CALOTES from Cherra Punji (presented by Mr. Firth) differs in having the head much flatter, the nuchal spines less laterally compressed or widely flattened and more rigid, being scarcely at all expanded on their terminal half, and in having a well marked second sincipital crest above the ear, shewing eight spines, the first three of which are short and the fifth longest: there is also no black stripe through the eye,—C. PLATYCEPS, nobis; *n. s.*

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* In PODICA and HELIORNIS we recognise the converse modification, in a Rallidous genus presenting the proportions of an ordinary swimmer. *N. B.* It should be remarked that we perceive little affinity between the true LARIDÆ and the PROCELLARIDÆ (or Albatrosses and Petrels).

† V. BIBRONI, nobis, *J. A. S.* XI, 869, we now consider to be a variety merely of this species, which appears to be the only *Varanus* of all peninsular India.

* The supposed CALOTES MYSTACEUS of the Nicobars *loc. cit.*, is a SALEA of Mr. Gray, except that the back is crested throughout; and a very similar species in the museum, save that the throat-skin is lax and forms a sort of *fanon*, was procured, we believe at Mizapore, by the late Major Wroughton.

C. VERSICOLOR. Specimens very strongly mottled, but apparently identical with the extremely common and only species of this genus we know of in Lower Bengal.

C. ROUXI? This species is probably distinct and undescribed: but as Dr. Kelaart has forwarded a series of Ceylon reptiles to Dr. Andrew Smith in England, we decline naming it at present. Crest of elevated flattened spines much longer than in C. VERSICOLOR, continued along the entire back and over the base of tail; two isolated spines, one before the other, above the ears; oblique plait of neck, before the shoulders, well marked in adults; a very slight *fanon,* or indication of one, on the throat; lateral scales fully twice as large as the abdominal; longest hind-toe reaching to the ear; tail ⅔ of the total length: colour fulvous-green, reddening on the throat of two specimens, under examination; tail (in the faded specimens) chiefly albescent; radiating dark marks on the eyelids, as in C. VERSICOLOR.

C. MYSTACEUS.† Nuchal and dorsal crest diminishing gradually to base of tail; two separate groups of 3 or 4 spines each above each ear; lateral scales not much larger than the abdominal; a very distinct well marked *fanon* in adults; tail ⅔ of the total length; longest hind-toe reaching to the ear; colour remarkable, green, with 4 or 5 large red blotches on each side; the tip of upper lip, border and under lip, and nape, appear to have been blue in adults; and the border of the upper lip yellow, continued as a broad stripe to the shoulder; no radiating mark on the eye-lids.

RANA BENGALENSIS, Gray, Hardw. *Ill. Ind. Zool.* In *J. A. S.* XVI. 1016, Dr. Cantor supposes the figure cited to have been perhaps intended for R. LESCHENAULTII. It is, however, a common Calcutta species which we had not previously seen from elsewhere, being more affined to R. MALABARICA, from which it differs in its much smaller size (never, that we have seen, attaining the magnitude of adult R. TEMPORARIA), and much more slender toes which are fully webbed;

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† Identical in species with examples since received from Rangoon.

the colouring is nearly similar, but it appears never to have the pale dorsal stripe, and the dark markings of the back are generally obsolete; there are never any distinct dark bands, also, upon the rami of the lower jaw, but the entire throat is *marbled* more or less distinctly. Another common Calcutta species of the same or smaller size (inhabiting also Arakan) is coloured exactly as in R. MALABARICA and varies similarly; but this (R. ASSIMILIS, nobis,) has invariably the hind-feet much less webbed, and the long second toe is nearly free for its terminal three phalanges.

POLYPEDATES CRUCIGER, nobis, *n. s.* This fine Tree Frog much resembles P. LEUCOMYSTAX in form, but is double the size, with no spots on the body, nor marbling of the posterior surface of the thigh; but a black line proceeds from each eye obliquely across to the loin on the opposite side, the two crossing each other over the occiput, and there is a small transverse line before and behind respectively, connecting the extremities of the two long diagonal lines; a black lateral line also from the corner of the eye terminates in a large black spot in some specimens, while in others the whole of these markings are more or less obliterated. Length of head and body 3¼ in.; of hind-limb to extremity of toe 5 in. *

In a collection of zoological drawings from Ceylon, obligingly forwarded for inspection by Mr. J. N. Mooyaart (at the request of Dr. Kelaart), we further recognise the common EUPREPIS MULTIFASCIATUS, (Wagler)—RANA LESCHENAULTII. D. and B.,—ENGYSTOMA MALABARICUM, Jerdon,—and a fine species of MEGALOPHRYS. CALOTES OPHIOMACHUS is coloured variously, and the fully adult at the height of the breeding season would appear to be of a deep blackish-green, with the usual transverse narrow white body-stripes, and the head and throat dark crimson.

FISHES. LETHRINUS——? Affined to L. HARAK, (Forster); and found also at the Sandheads;—PLATAX OCELLATUS, C. and V.; SYNANCEIA BRACHIO ? (fine specimen);—XYRICTHYS TÆNIURUS, Val.; CANNORHYNCHUS (*Fistularia*, auct.,) IMMACULATUS, (Forster);—ECHENEIS REMORA (probably from the Atlantic).

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* We have a still finer Tree Frog from the Naga hills, Asam (P. SMARAGDINUS, nobis). Length of head and body 3¼ in.; hind limb 5¼in. Wholly green above, changing in spirit to livid blue; under-parts pale.

TETRODON ARGENTATUS, nobis, *n. s.* Affined to T. OBLONGUS, Bloch. Colour livid brown above, with numerous specks and some larger scattered round spots of a deeper hue; dilatable abdominal skin of a livid or dead white; on the side a broad brilliant silvery stripe from mouth to tail, enclosing the pectoral, and a similar spot before the eye. Irides golden. Length 5½ in.; distance from the snout to pectoral 1⅝ in.; do. to dorsal 3 in.

6. From E. L. Layard, Esq. A collection of sundries from Ceylon. Among them is the skin of a Squirrel, which we consider to be merely a pale variety of Sc. MACROURUS, with worn and faded fur. Among the birds, we find a second example of CARPOPHAGA PUSILLA, nobis, *J. A. S.* XVIII, 816, described from a Nilgiri specimen: and the male and female of what will doubtless prove to be TRERON POMPADORA, (Gm.); differing only from TR. MALABARICA, Jerdon, in having a broad yellowish-green forehead, no trace of ruddy-orange on the breast of the male, and sullied white lower tail-coverts in both sexes (those of the male TR. MALABARICA being constantly of a deep ferruginous hue). The females are similar excepting in the colour of the forehead. Size rather inferior to that of TR. MALABARICA, the length of closed wing 5½ in. An EDOLIUS is also peculiar, and nearly resembles E. PARADISEUS of the Malay countries, but has the frontal crest more developed, though much less so than in the EDOLII we have seen from S. India. BUCEROS PICA, Scopoli, is also sent as the common Pied Hornbill of the Island: and other species of birds worthy of remark are PIPRISOMA (SMICRORNIS ?) AGILE,—new to the Ceylon fauna,—and DRYMOCATAPHUS FUSCACAPILLUS, nobis, *J. A. S.* XVIII, 815, but which should rather have been classed in PELLORNEUM. *

Mr. Layard has further favored us with a most valuable and interesting collection of shells, in all more than 200 species, and we have now to thank him for about 170 species, and fine series of many of them,—land, fresh-water, and marine,—while of others are sent inferior or imperfect examples, for report as to whether we required good specimens of the same, in which case Mr. Layard will forward them and has probably ere this done so. The species presented by him to the Society are from various parts of the world, but a large proportion of them, particularly of the land and fresh-water species, are from Ceylon. *

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* In the genus PELLORNEUM should likewise be merged DUMETIA, nobis. founded on the *Timalia hyperythra*, Franklin, *Malacocercus ? albogularis*, nobis, *J. A. S.* XVII. 453 of S. India and Ceylon. There would thus be four ascertained species of PELLORNIUM, Sw., all closely affiued to MALACOCERCUS in form and habits.

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* The following species of fishes have also, on different occasions, been presented to the Society by Mr. Layard.

Upeneus Russellii, C. and V.;—Holocentrum orientale, C. and V,;—Platycephalus scaber, (Bloch);—Glipisodon rahti. C and V,;—Chætodon sebanus, C. and V.;—Ch. Layardi, nobis, *n. s.*;—Acanthurus triostegus, (Bloch);—A. xanthurus, nobis, *n. s.*;—Amphacanthus javus, (L);—A. sutor, C. and V.;—Barbus tor (? B. Ham.). young;—Hemirhamphus Georgii, Val.;—and Rhombus triocellatus, Cuv.

Chætodon Layardi. nobis, *n. s.* Affined to Ch. vagabundus, L. General colour (in spirit) golden-brown, with a broad vertical blackish band from occiput to throat passing through the middle of the eyes, bordered behind by a white band of similar breadth, and this by a much narrower dark streak not reaching to the throat; lips and chin black, separated from the dark ocular band by a white space of the same breath; fins whitish, with a single black band crossing the tail,—another extends throughout the soft portion of the anal, and having a strongly defined white border above, and a less defined whitish border below, and the posterior or descending portion of the dorsal has also a similar black band, continued a little over the base of the tail; longitudinal bands on the sides as in Ch. vagabundus, &c. *D.* 13-21; *A.* 3-19; *C.* 17; *P.* 15; *V.* 1-5. Length of specimen 2 7-8. in.

Acanthurus xanthurus, nobis, *n. s.* Affined to A. xanthopterus, Cantor, but deeper in the body and wholly black with bright golden-yellow tail, and a tinge of the same upon the pectorals. *D.* 5-24; *A.* 3-21; *C.* 17; *P.* 15; *V.* 1-5. Length of specimen 7½ in.

Two species of Snakes have also been sent by Mr. Layard, viz. Trigonocephalus hypnalis, (Merrem), and Xenodon purpurascens, var.

N. B.—The drawings sent by Mr. Mooyaart for Mr. Blyth's inspection are of specimens collected in Southern India by the late Dr. John, the friend and cotemporary of Dr. Rottler. E. F. K.

LETTER (A.)

Kaduganava. 22*nd November,* 1852.

TO THE SECRETARY OF THE ASIATIC SOCIETY OF CEYLON.

My Dear Sir,—It gives me great pleasure to find you the successor of so worthy a man as the late Secretary, whose untimely death no one could deplore more sincerely than I do, and it is to be hoped that your period of Office will be a longer one, and that before it is terminated you will have established for the Society what is now wanted, viz. a Museum of all the Zoological productions of the Island. Calcutta, Madras, and Bombay have each a Museum, *Ceylon none,* or only apologies for one. The Society alone could not support an Institution of the kind, the aid of Government is required, and surely the Legislative Council will not hesitate to vote £100 a year for so laudable a purpose.

I regret that my health has not permitted me to complete the first part of our conjoint paper on the Ornithology of Ceylon. But if the Society will receive a small portion of it as an instalment of what is to come, I promise to have the rest done in time to appear in the next No. of the Journal. My work is nearly ready for delivery. Since it was completed I have come up here for the benefit of my health. Altho' the Estate is not very prolific of Coffee, its soil has yielded not less than 4 species of *Uropeltidæ,* or rough tails (Dapat Nayas), one the very remarkable species with keeled scales to the shield of the tail, *Siluboura Zeylonicus,* Cuv. R. A. ii. 76. The three others are not described in Gray's Catalogue, nor do they belong to any of the three divisions of *Uropeltidæ* given by Mr. Gray. I have proposed new genera for them. One of the three is already described in my work from specimens collected at Trincomalie. The two other are new to me, one a very elegant spacies I propose calling after an old friend *Uropeltis Trevelyani,* it is about 14 inches long, and one inch in circumference. Black above, margin of scales pale. White beneath with longitudinal series of black spots, formed of central spots on each scale. A line of triangular white spots, with their apices pointed upwards along each side; vent and lower part of tail white, which is carried on to the upper part. Tail short, obliquely truncated and nearly covered with a conical granular shield. Vent shields—1—2. The young is of a bluish or bluish black. Found about 3 feet under ground, in ant-holes.

The other species which I propose naming after our distinguished friend Mr. Blyth, is 16 inches long, circumference 1. 3-10th inch. Dark yellowish brown above with darker brown spots on the anterior third of scales. Paler beneath. Sides of nape and neck waved with angular spots of yellowish hue; yellow spots, on each side of vent. Rostrum yellow. Tail thick slightly truncated, conical, upper part of termination covered with a small subtriangular granular shield, lower surface smooth, covered with broad scales. Vent shields 1—2.—This species too is found in the same locality, but on softer ground, near rivulets.

Singular that I have not been able to get any specimen of a *Typhlops*, the *Argyrophis Bramicus* must be found in the paddy fields at Colombo, This is the only species of this genus hitherto seen in the Island. India produces many, and as many no doubt exist in Ceylon if people will only bring all they meet with in the marches. I am not collecting any birds, and I have not seen any which I have not previously got. The most numerous species here at present are two kinds of Finches. *Amadina undulata* and *A. Malabarica. Zosterops palpebrosus. Pycnonotus Hemorrhous* and *P. nigricapilla. Palæornis cyanocephalus* and your beautiful new species *P. Calthropæ. Psittacus asiaticus* is also abundant. *Copsychus saularis* and *Malacocercus griseus* are plentiful.

I have described a new species of house lizard found here, *Gymnodactylus Kandianus*, much smaller than the common house lizard of Colombo *Hemidactylus frenatus*, of which we have here a very large variety, I presume, unless it turns out to be the much coveted *H. Leschenaultii.* The new *Gecko* above alluded is a *diurnal species*, with round pupils. The pupils of every other species known in the Island are vertical, (like cat's eyes.) Here we see a very curious adaptation of the visual organs to the habits of the animal, I have also added lately *Peripia Peronii* to my list of *Geckotidæ*; it is easily known by its clawless thumbs. They are very abundant on every house in the Town of Kandy and Kaduganava. I hope you will induce other members of the Society to communicate in a familiar manner any zoological or botanical notes they may make, so that every circumstance however trivial and unimportant it may seem, may prove interesting to the *future*, if not to the *present* members of the Society. Nihil est aliud magnum quam multa minuta.

Believe me,
very sincerely your's
E. F. KELAART.

P. S.—Since writing the above I have spent a few days at Dr. Marshall's, Allagalla, where I obtained a species of NESSIA, probably identical with *N. Burtonii* of Gray, of which there appears to be only *one* specimen in the European cabinets, and that, too, at Fort Pitt Museum, doubtless sent there many years ago by some Army Medical Officer serving in Ceylon, if it proves now that my specimen is of the same species; of this, however, I have some doubts. You will observe that Gray founded the genus NESSIA from this solitary specimen in Fort Pitt, and named it after Staff Surgeon Burton who was then in charge of the Museum.

The specimen from Allagala (3000 ft) is vermiform in appearance, about 5 inches long, with four small legs having 3 subequal small toes on each—Dark rufous-brown above and spotted with darker brown on the anterior part of each scale. Dark grey beneath, clouded and spotted. Found in vegetable mould on a coffee plantation. From the same interesting locality I have a specimen of *Argyrophis Bramicus*, (young), brown above, with a broad pale whitish line beneath. The crenulated subterminal edge of the rostral and nasal shields bacame very perceptible after the specimen was immersed in spirits for some days. In the collection you have sent me for examination I find a *Typhlops* in which the head is partly destroyed. The other little spotted creature, of an olive brown colour, is evidently the young of a species of ACONTIAS, which is not described in Gray's Catalogue; if new, I shall have much pleasure in naming it *Acontias Layardi*. The only other species of the same genus in the British Museum is *A. meleagris* from the Cape of Good Hope. In form the genus ACONTIAS is very like NESSIA, without the limbs, or external opening to the ear.

LETTER (B.)

Colombo, 16th December, 1852.

My Dear Sir,—I have examined the bottle of specimens kindly lent to me by Dr. Lamprey of H. M's. 15th Regiment, and find among several interesting specimens a species of scinc probably *Mabouya elegans* of Gray, but more likely a variety of *Riopa punctata*, but not having at present a specimen of the latter to compare it with, I can only describe the creature.

About 4 inches long, scales smooth, body fusiform, tail short, conical, pointed. Limbs wide apart—5 toes: soles and palms granular. Light olive brown above, spotted with 6 lines of black spots. A broad silvery white line on each side; sides olive and spotted like the back. Head, cheeks and limbs spotted. Tail of a light rufous brown colour and spotted only on the upper parts. Under parts white, immaculate. In the same bottle is a very young creature of perhaps the same species, tail uniform light brown, and instead of lines of distinct dots on the back and sides, there are blackish lines alternated with white ones.

I have also ascertained beyond a doubt that the large Indian Tortoise (*Testuda Indica*) is found in the Northern parts of the Island, and one living specimen is, I believe, now in the possession of Mr. Justice Carr, Mutwal.

It is very gratifying to be informed that three Naturalists from Germany are shortly to visit Ceylon, and right welcome shall they be. If we cannot exhibit to them Cabinets of preserved specimens, I think they will not be disappointed in inspecting the specimens of animated nature found in this beautiful Isle of the sunny East. "Our cabinets are in the fields," under the canopy of heaven, with ministering angels for their Curators, and we but their humble, though not silent, admirers.

I remain,
Yours very faithfully,

E. F. KELAART.

To Edgar Layard, Esq.
Secretary,
Ceylon Asiatic Society.

Catalogue of Ceylon Birds. By E. F. KELAART, M.D. Edin., F.L.S., F.G.S., &c.; *and* EDGAR L. LAYARD, Esq., C.M.E.S., &c. (From the 'Journal of the Ceylon Asiatic Society' for January, 1853).

ORDER.—ACCIPITRES.

SUB-ORDER.—ACCIPITRES DIURNI.

FAM.—FALCONIDÆ.

a. AQUILINÆ.

Aquila Bonellii, *Temm.*
Aquila pennata, *Gmel.*
Spizaetus Nipalensis, *Blyth.*
Spizaetus limnaetus, *Horsf.*
Ictinaetus Malayensis, *Temm.*
Hæmatornis Cheela, *Latham.*
Hæmatornis spilogaster, *Blyth.*
Pontoaetus leucogaster, *Gmel.*
Pontoaetus Ichthyaetus.
Haliastur Indus, *Bodd.*

b. FALCONINÆ.

Falco Peregrinus, *Linn.*
Tinnunculus alaudarius, *Briss.*
Hypotriorchis chicquera, *Shaw.*

c. MILVINÆ.

Baza lophotes, *Temm.*
Milvus Govinda, *Sykes.*
Elanus melanopterus, *Daud.*

d. ACCIPITRINÆ.

Astur trivirgatus, *Temm.*
Accipiter badius, *Gmel.*
Accipiter nisus, *Linn.*

e. CIRCINÆ.

Circus Swainsonii, *A. Smith.*
Circus cineraceus, *Montagu.*
Circus melanoleucos, *Penn.*

SUB-ORDER.—ACCIPITRES NOCTURNI.

FAM.—STRIGIDÆ.

a. SURNINÆ.

Athene castanotus, *Blyth.*
Athene scutellata, *Gray.*

b. BUBONINÆ.

Ephialtes Scops, *Linn.*
Ephialtes sunia, *Hodgson.*
Ephialtes Lempijii, *Horsf.*
Ketupa Ceylonensis, *Gmel.*

c. SYRNINÆ.

Syrnium Indrani, *Gray.*

d. STRIGINÆ.

Strix Javanica, *Gmel.*

ORDER.—PASSERES.

SUB-ORDER I.—FISSIROSTRES.

A. F. NOCTURNI.

FAM.—CAPRIMULGIDÆ.

a. STEATORNINÆ.

Batrachostomus moniliger, *Layard.*

b. CAPRIMULGINÆ.

Caprimulgus Maharattensis, *Sykes.*
Caprimulgus Kelaarti, *Blyth.*
Caprimulgus Asiaticus, *Latham.*

B. F. DIURNI.

FAM.—HIRUNDINIDÆ.

a. CYPSELINÆ.

Cypselus Balasiensis, *Gray.*
Cypselus melba, *Linn.*
Cypselus affinis, *Gray.*
Macropteryx coronatus, *Tickell.*
Collocalia brevirostris, *M'Clelland.*
Acanthylis caudacuta, *Lath.*

b. HIRUNDININÆ.

Hirundo gutturalis, *Scop.*
Hirundo hyperythra, *Layard.*
Hirundo domicola, *Jerdon.*
Hirundo daurica, *Linn.*

FAM.—CORACIADÆ.

a. CORACIANÆ.

Coracias Indica, *Linn.*
Eurystomus orientalis, *Linn.*

FAM.—TROGONIDÆ.

Harpactes fasciatus, *Lath.?*

FAM.—ALCEDONIDÆ.

a. HALCYONINÆ.

Halcyon Capensis, *Linn.*
Halcyon Smyrnensis, *Linn.*
Halcyon atricapillus, *Lath.*
Ceyx tridactyla, *Linn.*

b. ALCEDONINÆ.

Alcedo Bengalensis, *Gmel.*
Ceryle rudis, *Linn.*

FAM.—MEROPIDÆ.

a. MEROPINÆ.

Merops Philippinus, *Linn.*
Merops viridis, *Linn.*
Merops quinticolor, *Keill.*

SUB-ORDER II.—TENUIROSTRES.

FAM.—UPUPIDÆ.

a. UPUPINÆ.

Upupa Senegalensis, *Swains.*

FAM.—PROMEROPIDÆ.

a. PROMEROPINÆ.

Nectarina Zeylanica, *Linn.*
Nectarina minima ? *Sykes.*
Nectarina Maharattensis, *Lath.*
Nectarina Lotenia, *Linn.*
Dicæum Tickellii, *Blyth.*

FAM.—MELIPHAGIDÆ.

a. MELIPHAGINÆ.

Phyllornis Malabarica, *Lath.*
Phyllornis aurifrons, *Temm.?*
Phyllornis Jerdoni, *Blyth.*

FAM.—CERTHIADÆ.

a. SITTINÆ.

Dendrophila frontalis, *Horsf.*

SUB-ORDER III.—DENTIROSTRES.

FAM.—LUSCINIDÆ.

a. MALURINÆ.

Orthotomus longicauda, *Gmel.*
Cisticola cursitans, *Blyth.*
Cisticola omalura, *Blyth.*
Drymoica valida, *Blyth.*
Drymoica inornata, *Sykes.*
Prinia socialis, *Sykes.*

b. LUSCININÆ.

Acrocephalus dumetorum, *Blyth.*
Phyllopneuste nitidus, *Blyth.*
Phyllopneuste montanus, *Blyth.*
Phyllopneuste viridanus, *Blyth.*

c. ERYTHACINÆ.

Copsychus saularis, *Linn.*
Copsychus macrourus, *Gmel.*
Pratincola caprata, *Blyth.*
Pratincola atrata, *Kelaart.*
Calliope cyanea, *Horsf.*
Thamnobia fulicata, *Linn.*
Cyanecula Suecica, *Linn.*
Sylvia affinis, *Blyth.*

d. PARINÆ.

Parus cinereus, *Vieill.*

e. MNIOTILTINÆ.

Zosterops palpebrosus, *Temm.*
Iora Zeylanica, *Gmel.*
Iora typhia, *Linn.*

f. MOTACILLINÆ.

Motacilla boarula, *Linn.*
Motacilla Indica.
Budytes (*Enicurus*) viridis, *Blyth.*
Corydalla (*Anthus*) Richardi, *Blyth.*
Corydalla rufula, *Vieill.*
Corydalla striolata, *Blyth.*
Brachypteryx Palliseri, *Kelaart.*
Drymocataphus fuscocapillus, *Blyth.*
Alcippe nigrifrons, *Blyth.*
Pitta brachyura, *Jerdon.*

FAM.—TURDIDÆ.

TURDINÆ.

Oreocincla spiloptera, *Blyth.*
Merula Wardii, *Jerdon.*
Merula Kinnisii, *Kelaart.*

c. TIMALINÆ.

Garrulax cinereifrons, *Blyth.*
Pomatorhinus melanurus, *Blyth.*
Malacocercus griseus, *Gmel.*
Malacocercus rufescens, *Blyth.*
Malacocercus striatus, *Swains.*
Dumetia albogularis, *Blyth.*
Chrysomma Sinensis, *Lath.*

d. ORIOLINÆ.

Oriolus melanocephalus, *Linn.*
Oriolus Kundoo? *Sykes.*
Oriolus Indicus, *Briss.*

e. PYCNONOTINÆ.

Criniger Ictericus, *Strickland.*
Pycnonotus penicillatus, *Kelaart.*
Pycnonotus flavirictus, *Strickland.*
Pycnonotus hæmorrhous, *Gmel.?*
Pycnonotus atricapillus, *Vieill.*
Niltava rubeculoides, *Hodgs.*
Hemipus picatus, *Horsf.*
Rubigula gularis, *Gould?*
Hypsipetes Nilgherriensis, *Jerdon.*

Fam.—MUSCICAPIDÆ.

f. MUSCICAPINÆ.

Cryptolopha cinereocapilla, *Blyth.*
Leucocerca compressirostris, *Blyth.*
Myiagra cærulea, *Vieill.*
Tchitrea paradisi, *Linn.*
Butalis latirostris, *Boie.*
Butalis ———?
Stoporala melanops, *Blyth.*

Fam.—AMPELIDÆ.

a. CAMPEPHAGINÆ.

Pericrocotus flammeus, *Forster.*
Pericrocrotus peregrinus, *Linn.*
Campephaga Macei, *Linn.*
Campephaga Sykesi, *Strickl.*

b. DICRURINÆ.

Artamus leucorhynchus? *Gmel.*
Artamus fuscus, *Vieill.*
Edolius Malabaricus, *Scop.*
Edolius retifer, *Temm.*
Dicrurus cærulescens, *Linn.*
Dicrurus edoliformis, *Blyth.*
Dicrurus longicaudatus, *A. Hay.*
Dicrurus leucopygialis, *Blyth.*
Dicrurus macrocercus, *Vieill.*
Irena puella, *Horsf.*

Fam.—LANIIDÆ.

a. LANIINÆ.

Lanius superciliosus, *Linn.*
Lanius erythronotus, *Vigors.*
Tephrodornis affinis, *Blyth.*

Sub-order IV.—CONIROSTRES.

Fam.—CORVIDÆ.

a. GARRULINÆ.

Cissa puella, *Blyth & Layard.*

b. CORVINÆ.

Corvus splendens, *Vieill.*
Corvus culminatus, *Sykes.*

Fam.—STURNIDÆ.

a. GRACULINÆ.

cula religiosa, *Linn.*
Gracula ptilogenys, *Blyth.*

b. STURNINÆ.

Pastor roseus, *Linn.*
Hetærornis pagodarum, *Gmel.?*
Hetærornis Malabarica, *Gmel.?*
Hetærornis cristatella, *Linn.*
Acridotheres tristis, *Linn.*

FAM.—FRINGILLIDÆ.

a. PLOCEINÆ.

Ploceus Bengalensis, *Linn.*
Ploceus Philippensis, *Linn.*
Ploceus Manyar, *Horsf.*

b. FRINGILLINÆ.

Amadina undulata, *Lath.*
Amadina Malabarica, *Linn.*
Amadina Malacca, *Linn.*
Amadina rubronigra, *Hodgs.*
Amadina striatus? *Linn.*
Amadina pectoralis? *Jerdon.*
Passer Indicus, *Jard. & Selby.*

d. ALAUDINÆ.

Alauda Malabarica, *Scop.*
Alauda gulgala? *Scop.*
Pyrrhula grisea, *Scop.*
Mirafra affinis, *Jerdon.*

FAM.—BUCEROTIDÆ.

a. BUCEROTINÆ.

Buceros Gingalensis, *Shaw.*
Buceros violaceus, *Wagler*, apud *Blyth.*
Buceros Pica, *Scop.?*

ORDER.—SCANSORES.

FAM.—PSITTACIDÆ.

a. PSITTACINÆ.

Loriculus Asiaticus, *Edwards.*

b. PEZOPORINÆ.

Palæornis Alexandri, *Linn.*
Palæornis torquatus, *Briss.*
Palæornis cyanocephalus, *Gmel.*
Palæornis Calthropæ, *Layard.*

FAM.—PICIDÆ.

a. CAPITONINÆ.

Megalaima Philippensis, *Briss.*
Megalaima Zeylanica, apud *Blyth.*
Megalaima flavifrons, *Cuv.*
Megalaima rubricapilla, *Gmel.*

b. PICINÆ.

Picus gymnophthalmos, *Blyth.*
Picus Macei, *Vieill.*
Picus Maharattensis, *Lath.*

c. GECININÆ.

Gecinus chlorophanes, *Blyth.*
Brachypternus aurantius, *Blyth.*
Brachypternus Ceylonus, *Forster.*
Brachypternus rubescens, *Vieill.*

d. COLAPTINÆ.

Micropternus gularis, *Blyth.*

FAM.—CUCULIDÆ.

a. COCCYZINÆ.

Centropus Philippensis, *Cuv.*
Centropus chlororhynchos, *Blyth.*

b. CUCULINÆ.

Oxylophus melanoleucos, *Gmel.*
Oxylophus Coromandus, *Linn.*
Eudynamys orientalis, *Linn.*
Cuculus micropterus, *Gould.*
Cuculus tenuirostris, *Blyth.*
Cuculus Sonneratii, *Lath.*
Cuculus varius, *Vahl.*
Cuculus canorus, *Linn.*
Cuculus (*Surniculus*) dicruoides, *Hodgs.*
C. (*Chrysococcyx*) xanthorhynchos, *Hor.*

c. CROTOPHAGINÆ.

Phœnicophaus pyrrhocephalus, *Forster.*
Zanclostomus viridirostris, *Jerd.*

ORDER.—COLUMBÆ.

FAM.—COLUMBIDÆ.

a. TRERONINÆ.

Treron bicincta, *Blyth.*
Treron Malabarica, *Jerdon.*
Treron chlorigaster, *Blyth.*

b. COLUMBINÆ.

Alsocomus puniceus, *Tick.*
Carpophaga pusilla, *Blyth.*
Carpophaga (*Palumbus*) Torringtonii, *Kel.*
C. Elphinstonei var. apud *Blyth.*
Columba intermedia, *Strickland.*
Turtur risorius, *Selby.*
Turtur Suratensis, *Gmel.*
Turtur humilis, *Temm.*
Turtur orientalis, *Lath.*

c. GOURINÆ.

Chalcophaps Indica, *Linn.*

ORDER.—GALLINÆ.

FAM.—PHASIANIDÆ.

a. PAVONINÆ.

Pavo cristatus, *Linn.*

b. GALLINÆ.

Gallus Lafayettei, *Lesson*, (G. Stanleyi, *Gray*, female, apud *Blyth*).

FAM.—TETRAONIDÆ.

a. PERDICINÆ.

Gallo-perdix bicalcaratus, *Lin.* ap. *Blyth.*
Francolinus Ponticerianus, *Gmel.*
Perdicula argoondah, *Sykes.*
Coturnix Coromandelica, *Gmel.*
Coturnix Chinensis, *Linn.*
Turnix ocellatus, *Scop.*
Turnix ocellatus, *var.* Taigoor, *Sykes.*

ORDER.—GRALLÆ.

FAM.—CHARADRIDÆ.

a. ŒDICNEMINÆ.

Esacus recurvirostris, *Cuv.*
Œdicnemus crepitans, *Linn.*

b. CURSORINÆ.

Cursorius Coromandelicus, *Gmel.*

c. GLAREOLINÆ.

Glareola orientalis, *Leach.*

d. CHARADRINÆ.

Charadrius virginicus, *Bechst.*
Lobivanellus Goensis, *Strickland.*
Lobivanellus (*Sarciophorus*) bilobus, *Gm.*
Hiaticula Philippensis, *Lath.*
Hiaticula Leschenaultei, *Lesson.*
Hiaticula Cantiana, *Lath.*

e. CINCLINÆ.

Cinclus interpres, *Linn.*

FAM.—ARDEIDÆ.

a. ARDEINÆ.

Ardea cinerea, *Linn.*
Ardea purpurea, *Linn.*
Ardea asha, *Sykes.*
Ardea intermedia, *Wagln.*
Ardea Garzetta, *Linn.*
Ardeola leucoptera, *Bodd.*
Ardeola Bubulcus, *Savig.*
Herodias alba, *Linn.*
Ardetta cinnamomea, *Gmel.*
Ardetta flavicollis, *Lath.*
Ardetta thalassina? *Swains.*
Ardetta Sinensis, *Gmel.*
Platalea leucorodia, *Linn.*
Nycticorax griseus, *Linn.*
Tigrisoma melanolopha, *Raffles.*
Butorides Javanica, *Horsf.*

b. CICONINÆ.

Mycteria australis, *Lath.*
Leptoptilus Javanica, *Lath.*
Ciconia leucocephala, *Temm.*
Dromas Ardeola, *Payk.*
Anastomus oscitans.

c. TANTALINÆ.

Tantalus leucocephalus, *Forster.*
Geronticus melanocephalus, *Lath.*
Ibis Falcinellus, *Linn.*

FAM.—SCOLOPACIDÆ.

a. LIMOSINÆ.

Numenius phœopus, *Lath.*
Numenius arquatus, *Lath.*

b. TOTANINÆ.

Totanus fuscus, *Linn.*
Totanus ochropus, *Linn.*
Totanus calidris, *Linn.*
Totanus hypoleucos, *Linn.*
Totanus glottoides, *Vigors.*
Actitis glareola, *Gmel.*
Limosa ægocephala, *Linn.*

c. TRINGINÆ.

Tringa minuta? *Temm.*
Tringa subarquata, *Gmel.*
Limicola platyrhyncha, *Temm.*

d. RECURVIROSTRINÆ.

Himantopus candidus, *Bonn.*
Recurvirostris Avocetta, *Linn.*
Hæmatopus ostralegus, *Linn.*

e. SCOLOPACINÆ.

Rhynchea Bengalensis, *Gmel.*
*Scolopax rusticola, *Linn.*
Gallinago stenura, *Temm.*
*Gallinago scolopacinus, *Bonaparte.*
*Gallinago Gallinula, *Linn.*

N.B.—We have only sportsmen's authority for the species of snipe marked with an asterisk.

FAM.—PALMEDEIDÆ.

PARRINÆ.

Hydrophasianus Sinensis, *Wagler.*

FAM.—RALLIDÆ.

a. RALLINÆ.

Ortygometra rubiginosa, *Temm.*
Corethrura Zeylanica, *Brown.*
Rallus striatus, *Linn.*
Rallus Indicus, *Blyth.*
Porzana pygmæa, *Nan.*

b. GALLINULINÆ.

Gallinula phœnicura, *Pennant.*
Gallinula cristata, *Lath.*
Gallinula chloropus, *Linn.*
Porphyrio poliocephalus, *Lath.*

ORDER.—ANSERES.

FAM.—ANATIDÆ.

a. PHŒNICOPTERINÆ.

Phœnicopterus ruber? *Linn.*

b. PLECTROPTERINÆ.

Sarkidiornis regia, *Eyton.*

c. ANSERINÆ.

Nettapus Coromandelianus, *Gmel.* ?

d. ANATINÆ.

Mareca Penelope, *Linn.* ?
Anas pœcilorhyncha, *Lath.*
Dendrocygna acuta, *Swains.*
Dafila acuta, *Bonap.*
Querquedula Crecca, *Steph.*
Querquedula circia, *Linn.*
Fuligula rufina, *Pallas.*
Spatula clypeata, *Linn.*

FAM.—COLYMBIDÆ.

PODICEPINÆ.

Podiceps minor, *Lath.*

FAM.—LARIDÆ.

a. LARINÆ.

Xema brunneicephalus, *Jerdon.*
Larus ichthyaetus, *Pallas.*

b. STERNINÆ.

Sylochelidon Caspia, *Pall.*
Sylochelidon serna, *Sykes.*
Hydrochelidon Indica, *Steph.*
Gelichelidon Anglica, *Brown.*
Onychoprion anasthætus, *Scop.*
Sterna melanogaster, *Temm.*
Sterna Javanica, *Horsf.*
Sterna minuta, *Linn.*
Sterna ——— ?
Thalasseus cristatus, *Steph.*
Thalasseus Bengalensis, *Lesson.*
Tachepetes Aquila.

FAM.—PELICANIDÆ.

a. PLOTINÆ.

Plotus melanogaster, *Gmel.*

b. PELICANINÆ.

Pelecanus Philippensis, *Gmel.*
Graculus Sinensis, *Shaw.*
Graculus pygmæus, *Pallas.*

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Vol. II. **Part 1.**

MUSEUM OF ZOOLOGY 1927-L92

PRODROMUS

FAUNÆ ZEYLANICÆ;

BEING

CONTRIBUTIONS TO THE ZOOLOGY

OF

CEYLON.

BY E. F. KELAART, M.D., F. L. S., &c., &c.

STAFF SURGEON TO THE FORCES.

VOL. II.—PART I.

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CONTENTS:

Natural History of Newera Ellia.

Description of Ceylon Mammalia.

Catalogue of Ceylon Birds.

Description of New Species of Ceylon Birds.

Description of Ceylon Reptiles.

APPENDIX.

Dr. Gardner on the Flora of Ceylon.

Sold in Ceylon by

Messrs. Clarke Romer and Co., Colombo; Messrs. Milne Cargill and Co., Galle;

And in London by J. Van Voorst, 1, Paternoster Row.

"The zeal and industry of Staff-Surgeon Kelaart has, in this "Prodromus," opened to us almost a new field in Natural History, and the Ceylon press, the best missionary that has ever gone to the East, has given it form and shape. It is, indeed a gratifying task for us to welcome such a work from the pen of an Army Surgeon, composed amidst the excitements and temptations of Indian life; and we could wish that other Officers would follow so good an example. The work contains a descriptive account of Ceylon Mammalia, of the Saurian, Chelonian, and Emydosaurian reptiles; of the Amphibia, and the Ornithology, besides a catalogue of the Birds of the Island, and a sketch of the Natural History of Newera Ellia. The Appendix is enriched with observations on the Flora of Ceylon, and additional remarks on its animals, which form altogether a most valuable contribution to the lore of the Naturalist."

United Service Mag., November, 1852.

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"Nihil est aliud magnum quam multa minuta."

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[*From the Journal of the Asiatic Society of Ceylon,* 1853.]

NOTICE.

In presenting to Naturalists a more complete Synopsis of Ceylon Reptiles, which the continued kindness of friends in various parts of the Island has enabled me to form, I have much pleasure in expressing my best thanks to the Members of the Asiatic Society of Ceylon, and to Sir George Anderson, Dr. Fergusson, P.M.O., and the Hon'ble C. J. MacCarthy, Esq., Colonial Secretary, for the facilities they have afforded me in my further researches in the Natural productions of the Island.

The joint labours of Mr. Edgar Layard and myself have nearly completed the examination of the Mammals, Birds, Shells, Reptiles and Insects of this Island. The fresh water Fishes are now engaging my attention, and any specimens of this Class will be thankfully received. Dr. Schmarda, Professor of Zoology of the University of Prague, is now on a visit to the Island for the chief purpose of examining the Infusoriæ, and Professor Harvey of Trinity College, Dublin, is also, I believe, at present engaged in examining into the Echinodermata and Crustacea of the Island, so that it may be hoped, it will not be very long before the neglected Fauna of Ceylon is completely worked out.

SYNOPSIS
OF
CEYLON REPTILES.

ORDER. SAURA. *Lizards.*

SUB-ORDER. I. LEPTOGLOSSÆ.

Slender-tongued Lizards.

FAM: MONITORIDÆ. *Monitors.*

1	Monitor Dracæna, *Gray.*	Guana. TallaGoya, *Sing.*
2	Hydrosaurus Salvator, *Wagler.*	Water Guana. Cabara Goya, *Sing.*

FAM: SCINCIDÆ. *The Scincs.*

3	Riopa punctata, *Gray.*	Puchee Bramin, *Port.*
4	Riopa Hardwicki, *Gray.*	do.
5	Mabouia elegans. (?) *Gray.*	do.
6	Taliqua rufescens, *Gray.*	Large do.

FAM: ACONTIADÆ.

7	Nessia Burtoni. (?) *Gray.*	Ground Bramin.
8	Acontias (?) Layardi, *n. s.*, *nobis.*	Layard's do.

FAM: TYPHLOPSIDÆ. *Typhlops.*

9	Argyrophis Bramicus, *Daud.*	Silver snake.
	———— 2 varieties.	

FAM: UROPELTIDÆ. *Rough tails, or False snakes.*

Dapatnaya, *Sing.*

10 Uropeltis grandis, *n. s.*, *nobis.*
11 Uropeltis Pardalis, *n. s.*, *nobis.*
12 Uropeltis Saffragamus, *n. s.*, *nobis.*
13 Rhinophis Blythii, *n. s.*, *nobis.*
14 Dapatnaya Lankadivana, *n. s.*, *nobis.*
15 Dapatnaya Trevelyana, *n. s.*, *nobis.*
16 Siluboura Ceylonicus, *Gray.*

SUB-ORDER II. PACHYGLOSSÆ.

Thick-tongued Lizards.

FAM: GECKOTIDÆ. *The Geckoes.*

Cheechas, *Port.* Hoona, *Sing.*

17 Hemidactylus trihedrus, *Lesson.*	The triangular tubercled Gecko.
18 Hemidactylus maculatus, *Dum. et Bib.*	The spotted do.
19 Hemidactylus Pieresii, *n. s.*, *nobis.*	Pieres' Gecko.
20 Hemidactylus Coctœi, *Dum. et Bib.*	Cocto's do.
21 Hemidactylus frenatus, *Schlegel.*	The streaked Gecko.
22 Hemidactylus Leschenaultii, (?) *Dum. et Bib.*	Leschenault's do.
23 Boltalia sublævis, *Gray.*	The Boltalia.
24 Peripia Peronii, *Dum. et Bib.*	Peron's Gecko.
25 Gymnodactylus (?) Kandianus, *n. s.*, *nobis.*	The diurnal Gecko.

FAM: AGAMIDÆ. *The Agamas.*

Blood-suckers, *Vulg.* KattooSah, *Sing.*

26	Sitana Ponticereana, *Cuvier.*	The Sitana.
27	Lyriocephalus scutatus, *Wagler.*	Lyre-headed Lizard.
28	Ceratophora Stoddartii, *Gray.*	The needle-nosed Lizard
29	Salea Jerdonii, *Gray.*	Dr. Jerdon's Salea.
30	Calotes Ophiomachus, *Gray.*	Red headed Green Lizard.
31	Calotes Rouxi, *Gray. Blyth.* vel C. Viridis, *Gray. apud nos.*	Green Lizard.
32	Calotes mystaceus, *Dum. et Bib.*	Red spotted Green Lizard.
33	Calotes versicolor, *Dum. et Bib.*	The common Blood-sucker.

FAM: CHAMELEONIDÆ. *Chameleons.*

34	Chameleo vulgaris, *Daud.*	The true Chameleon.

ORDER. OPHIDIA. *Serpents.*

Cobras, *Port.* Saroopeya, Satta, *Sing.*

Innocuous Serpents.

FAM: BOIDÆ.

BURROWING.

35	Cylindrophis maculata, *Wagler.*	The red and black netted Snake.

TERRESTRIAL.

36	Python molurus, *Gray.*	The Rock Snake.

FAM: COLUBERIDÆ. *Bonaparte.*

TERRESTRIAL.

37 Calamaria Scytale ?

38 Lycodon, 2 or more species.

39 Xenodon purpurascens, *Schlegel.* var.

40 Coluber Korros, *Reinwardt.*

ARBORIAL.

41 Dipsas multimaculata (?) *Schlegel.*

42 Dryinus Prasinus, *Reinwardt.* The Whip Snake.

D. nasutus 2 or more varieties.

43 Leptophis pictus, *Gmelin.*

44 Leptophis ornatus, *Shaw.*

45 Leptopthis sp.

AQUATIC. Deye Naya, *Sing.*

46 Tropidonotus umbratus, *Daudin.* (var.) Large blackish water Snake.

47 Tropidonotus stollatus, *Linn.* The speckled do.

48 Tropidonotus schistosus, *Daud.* The olive brown do.

49 Cerberus cinereus, *Cuvier.* The black do.

Venomous Serpents.

FAM: VIPERIDÆ. *Vipers.*

TERRESTRIAL.

50 Bungarus candidus, *Linn.*

51 Naya lutescens, *Daudin.* var. Cobra de Capello.

———var. Nigra.

ARBORIAL.

52 Trigonocephalus Hypnale, *Wagler.* Caravilla.

53 Trimesurus gramineus, *Shaw.* The green Caravilla.

54 Trimesurus Ceylonensis (?) *Gray. apud Gray.*

55 Megaera trigonecephala, *Wagler.* Palagolla.

56 Daboia elegans, *Gray.* }
57 *Daboia Russellii, Gray.* } Polanga.

N. B.—There are about six or eight more Ceylon Snakes, which have not yet been identified.

ORDER. CHELONIA. *Tortoises.*

Cowdoo, *Port.* Ibba, *Sing.*

FAM: TESTUDINIDÆ.

58 Testuda Indica, *Gmelin.* The large land Tortoise.

59 Testuda stellata, *Schweig.* The yellow starred do.

FAM: EMYDIDÆ.

60	Emys trijuga, var. *Schweig.*	Marsh Tortoise. Gal Ibba. *Sing.*
61	Emys Seba, *Gray, apud Blyth.*	do.
62	Emyda punctata. *Gray.*	River Tortoise. Keerec Ibba. *Sing.*

FAM: CHELONIDÆ.

63	Caretta imbricata, *Gray.*	Sea Turtle. Kokoeloo koosoomba, *Sing.*
64	Chelonia virgata, *Schweig.*	Edible do. Gal koosoomba, *Sing.*

ORDER. EMYDOSAURI. *Crocodiles.*

Lagartoo, *Port.* Kimboola, *Sing.*

65	Crocodilus porosus, *Schweig.*	The Indian river Crocodile. Allie Kimboola, *Sing.*
66	Crocodilus palustris, *Lesson, male.*	Marsh Crocodile. Halle Kimboola. *Sing.*

Crocodilus Bombifrons, female. apud Blyth.

AMPHIBIA.

ORDER. BATRACHIA, *Frogs.*

Madookoo, *Port.* Attykitta, *Sing.*

FAM: RANIDÆ, *Water Frogs.*

67	Rana cutipora, *Dum. et Bib.*	Large green bull Frog.
68	Rana Malabarica, *Dum. et Bib.*	The green spotted bull Frog.
69	Rana Bengalensis, *Gray.*	The small green do.
70	Rana Tigrina, *Daudin.*	The golden Frog.
71	Rana Newera Elliana, *nobis.*	The blackish Frog.
72	Rana Kandiana, *nobis.*	The red bellied Frog.
73	Rana Leschenaultii (?) *Dum. et Bib. apud Blyth.*	Leschenault's Frog.

FAM: HYLIDÆ. *Tree Frogs.*

Ghas Gemba. Attykitta, *Sing.*

74 Polypedates leucomystax, *Gravenhorst.*	The common tree Frog.
75 Polypedates cruciger, *Blyth.*	The cross-backed do.
76 Polypedates stellata, *nobis.*	The white spotted green tree Frog.
77 Limnodytes mutabilis, *nobis.*	The changeable tree Frog.
78 Limnodytes maculata, *nobis.*	The brown spotted do.

FAM: BUFONIDÆ. *Toads.*

Gemmadea, *Sing.*

79 Bufo melanostictus, *Schneider.*	The common house Toad.
80 Engystoma marmorata, *Gray.*	The green spotted do.
81 Engystoma cinnamomea, *nobis.*	The red do.

ORDER. PSEUDOPHIDIA.

FAM: CÆCILIIDÆ.

82 Ichthyophis glutinosus, *Gray.*	The glutinous Slow worm.

N. B.—Mr. Blyth in his last Report, J.A.S.B. No. 4 of 1853, enumerates among the Reptiles I sent him, the following new species, *Limnodytes lividus*, *L. macularis*, *Engystoma rubrum*, Jerdon. *Pyxicephalus Fodiens*, Jerdon, and *Rana robusta.*

DESCRIPTION
OF
NEW OR LITTLE KNOWN SPECIES
OF
REPTILES.

ORDER. SAURA.

TRIBE. GEISSOSAURA.

FAM. ACONTIAS, (ACONTIADÆ.)

Head small, shielded. Muzzle conical. Rostral rather large, cup-shaped, internasal short, frontal large, frontoparietal none, interparietal triangular, moderate. Eyes distinct. Eyelids, lower well developed, upper small or wanting. Nostrils in the middle of the side of the rostral shield, with a slit to its hinder edge. Tongue scaly, imbricate, nicked at the point. Ears very small or hidden. Femoral pores none. Body cylindrical. Limbs 4, very short, or none. Scales smooth.—*Gray.*

GENUS. NESSIA. *Gray.*

Muzzle conical. Ears very small, dotlike. Body cylindrical, elongate, sides rounded. Scales smooth. Legs 4, very short, far apart. Toes 3-3, subequal, clawed.

NESSIA BURTONI? *Gray.*

Dark rufous-brown above, and spotted longitudinally with darker brown spots. Dark grey beneath, clouded and indistinctly spotted. Tail cylindrical, rounded at the end, and coloured and spotted like the body. Limbs 4, very small, each with 3 subequal toes.

Length 5½ inches.

Habitat. Allagalla (3000 feet.)

The only specimen which I have examined is one obtained from vegetable soil in a Coffee Estate under the superintendence of Dr. Marshall.* I am informed that this reptile is common at Ambegammoa.

If my identification is correct, it would appear probable that the only specimen in Europe, found in the Army Medical Officers' Museum at Fort Pitt, was sent from Ceylon. The specimen was named after Staff Surgeon Burton, who was the Curator of the Museum when Dr. Gray visited that establishment.

GENUS. ACONTIAS. *Cuvier.*

Head conical. Nostrils lateral. Internasal broad, 6 sides, frontal large, 6 sided, frontonasals and frontoparietals none; interparietals small, triangular, parietal moderate. Tongue flat, scaly, nicked at the tip. Teeth conical, blunt. Palate not toothed, with a longitudinal groove. Eyes very small. Upper eyelid wanting, lower short, scaly, opaque. Ears hidden under the skin. Body cylindrical, elongate. Scales smooth. Limbs none, exserted. Tail cylindrical, short rounded at the end.—*Gray.*

ACONTIAS (?) LAYARDI. *n. s., nobis.*

Light olive, and spotted longitudinally with brown spots, paler beneath.

Length of young 4 inches.

Habitat. Soil of the Cinnamon Gardens of Colombo.

---

* I have since received several smaller specimens from Kaduganava.

The form of this reptile is distinguished from that of Nessia, above described, by the absence of limbs; in other respects it is very like the outline characters of Nessia. Mr. Layard procured me the specimens (apparently young) of this curious lizard.

The only other species described in Gray's Catalogue, is one from the Cape of Good Hope.

Mr. Blyth writes that he has described an allied Genus, from Rangoon, by the name of OPHISEPS.

FAM. UROPELTIDÆ.

ROUGH TAILS. DAPAT-NAYA, *Sing.*

Head conical, compressed, shelving and acute in front, flat above, behind. Crown covered with regular shields. Rostral produced, moderate, convex, horny, subtriangular, erect, produced, and acute behind. Nostrils roundish, lateral, simple, in the middle of the front of an erect subtriangular band-like nasal. Internasal none, frontonasal subtriangular, truncated below, contiguous above, frontal and frontoparietal distinct. Nape scaly. Labial shields $\frac{4}{4}$ distinct. Eyes distinct, lateral, in the middle of the front of an erect eye-shield, and covered by the shield without any eyelids. Eyebrow shield none. Tongue elongate, flat, forked at the tip. Body cylindrical. Scales 6 sided, smooth, those of the hinder part and above the tail sometimes 2-keeled. Vent with three scales in front. Tail cylindrical, obliquely truncated above.

This family is intermediate between the Lizards and the Snakes; following Cuvier and others, I was induced to refer it to the latter order, and therefore did not insert it in the Synopsis of the Families: but on re-examination and comparison with the various modifications presented by the genera of Typhlopsidæ, I have been induced to place it in the order of Lizards. Cuvier seems to have been in doubt, for though he placed the genus with the Snakes, he also regarded the species as a section of the Typhlopses. Schlegel names the group Pseudo Typhlops.—(*Gray's Synopsis.*)

This curiously formed family of Reptiles is known in the Island as *Dapat Nayas*, or double headed snakes. The natives consider them poisonous, but my experience of their habits makes me believe that they are perfectly harmless, and that they are timid creatures, seldom making their appearance above ground; living chiefly in ant-hills or dunghills, sometimes also several feet deep in rich loamy soil. They feed on ants, small earth-worms and larvæ of insects.

It appears from Dr. Gray's Catalogue, that in the Museums of Europe there are only three species, and of these three only one is from Ceylon, viz., Siluboura Ceylonicus,* many specimens of which I have found in the Kandyan Hills since my work on the Fauna of Ceylon was published. I have also, since the publication of that work, collected four other species, making in all six distinct undescribed or new species of Rough Tails (Uropeltidæ) in the Island of Ceylon, which I shall now describe in a connected form.

Dr. Gray subdivides the family into three groups, and I have added a fourth, to admit of two species, only one of which I have described in the Prodromus.

GENUS. RHINOPHIS. *Hempr.*

Tail obliquely truncated, upper part rather convex, covered with a small oblong shield, lower edge rounded, simple, rather produced. Head acute, tapering in front. Vent shields in one marginal row.

RHINOPHIS BLYTHII. *n. s., nobis.*

Dark yellowish brown above, with darker brown spots on the anterior third of scales. Paler beneath. Rostrum yellow. Sides of nape and neck waved with angular marks of a yellowish hue; yellow spots on each side of vent. Tail thick, slightly truncated, conical, upper part near termination has a small subtriangular nearly smooth shield, lower surface covered with broad scales. Vent shields 1-2.

---

* *Vide* Prodromus Faunæ Zeylanicæ.

Length 16 inches, circumference of the middle of body 1. 3-10 inches. Tail and neck rather thicker.

Habitat. Mountains of Ceylon.—Three specimens found 3 or 4 feet below the surface soil of Coffee plantations.

GENUS. UROPELTIS, (part). *Cuvier.*

Tail obliquely truncated, flattish, and covered with a flat roundish radiating granular shield, lower edge rounded, the under side of tail with 6 series of small scales.

UROPELTIS SAFFRAGAMUS. *n. s., nobis.*

Head dark olive brown, the rest of the upper surface of a blackish brown colour, with bluish bronze reflections. Beneath white. A pale white spot on each side of neck near the head. Tail deeply truncated and nearly covered with a large flat circular blackish granular shield, white and rounded beneath, and lower part covered with five series of small scales, the central series broader than the lateral ones. Vent shields 1-2. The neck and forepart of the body much thicker.

Length 9 inches.

Habitat. District of Saffragam, near Adam's Peak.

The only specimen of this species, which I have as yet seen, is one sent by Mr. Barnes De Zilva from Ratnapoora.

UROPELTIS GRANDIS. *n. s., nobis.*

Above dark brown with a bluish metallic lustre, anterior part of each scale with a blackish spot. Beneath of a pale yellow colour, spotted brown on the anterior part of scale.

Head of a light olive brown colour. Tail short, abruptly truncated; the truncated surface entirely covered with a large circular, granular shield. Vent scales 1-2.

Total length superiorly, 1 foot 7 inches. Inferiorly, 1 foot 8 inches. Tail shield nearly the size of a shilling piece. Head 8-10 inch in length.—Greatest circumference 2¾ inches, near the neck.

Habitat. Southern Province.

The only specimen I have seen of this very large Rough Tail, is one procured by Mr. Balkhuysen of the Colonial Medical Service, from Kerinday near Matura.

Uropeltis Pardalis. *n. s., nobis.*

Head small, dark olive. Upper parts black with beautiful bluish bronze reflections, irregularly spotted white. Beneath yellowish white, marked with large and small black spots, variously shaped; some pale eyed. Tail very short, obliquely truncated, and with a large flat orbicular granular shield. Length, 6¼ inches; circumference ¾ inch.

Habitat. Matura. I am indebted to the Rev. Mr. Ondaatje for the only specimen I have examined of this species. The black spots on the lower parts occupy more than one scale, generally two or three contiguous scales; and they are placed without any order in various directions. The chin and throat immaculate.

Genus. Dapatnaya. *n. g.*

Tail obliquely truncated, upper part and tip covered with a large semiconical granular shield. Vent shields 1-2.

Dapatnaya Lankadivana. *n. s., nobis.*

Above dark brown, beneath paler. Scales with pale margins. Head yellowish in some. Rostrum yellow. Shield of tail sloping down to the lower surface. Vent scales yellow; in some the yellow spot extends beyond the vent.

Length, from 1 to 2 feet.

Thickness nearly the same throughout, about 1 inch.

Habitat. Common at Trincomalie, and in the Kandyan Province. Found 2 or 3 feet under ground, and in ant-hills. The young is of a dark olive brown colour.

DAPATNAYA TREVELYANA. *n. s., nobis.*

Black above, margin of scales pale. White beneath, with longitudinal series of black spots, formed of central spots on each scale. A line of triangular white spots, with their apices directed upwards, along each side. Vent white. A white line rising from this spot runs over the tail, and another whitish line extends forwards from the vent for about ¾ inch. Tail short, and nearly covered with a white semi-conical granular shield, tip ridged, a little produced.

Length from 12 to 18 inches; nearly of the same thickness throughout, about 1 inch.

Habitat. Kandyan Hills, 3 or 4 feet under ground, and in the soil near the roots of Coffee trees and Cane.

Some of the young are of a bluish colour, others are spotted on the back.

TRIBE. NYCTISAURA.

FAM. GECKOTIDÆ.

BOLTALIA.

Toes free, ovate and dilated towards the end, with two series of straight narrow nearly transverse closely adpressed plates beneath, divided by a deep narrow groove, last joint compressed, free, rather exserted, clawed. Thumb dilated, and with a compressed last joint, like the toes, but clawless. Back with granular scales and a few scattered larger granules.

Sides simple. Tail rather depressed, tapering, ringed, with a central series of broad scales beneath.

BOLTALIA SUBLÆVIS. *Gray.*

Above dark rufous brown; beneath sulphureous yellow, sometimes clouded with black. Back granular, with two or more longitudinal lines of larger granules on each side. Scales of chin large. Tail armed with adpressed spines in rings. Femoral pores in males only, from 16 to 20.

Length 5½ inches.

Habitat. The Central and Southern Provinces.

This Gecko I obtained in great abundance in Galle; I have also seen a few at Kaduganava, after the publication of the Prodromus. It is rarely seen on the walls of houses, generally on trees, and on the roofs of houses. The rufous brown colour changes at times into a dark grey, mottled with black. When immersed in spirits the rufous brown colour is entirely lost.

This Gecko has been mistaken for *Hemidactylus Leschenaultii*, and also, for a large variety of *H. frenatus*, but the clawless compressed last joint of the thumb will distinguish this Lizard from others. From *Peripia Peronii* it is sufficiently removed by its granular back and armed tail. This Lizard cannot be confounded with *Hemidactylus Coctæi.* It has very little resemblance to it, and the thumb of *H. Coctæi* is clawed. (*Vide* Prodromus Faunæ Zeylanicæ, vol. I.)

ORDER. BATRACHIA.

SUB-ORDER I. SALIENTIA.

FAM. RANIDÆ. *Frogs.* ATTY KITTA. *Sing.*

GENUS. RANA. *Linn.*

Skin smooth, hinder extremities very long, formed for leaping; toes palmated, teeth in the upper jaw, and in the palate.

RANA KANDIANA. *n. s., nobis.*

Beautiful grass green above, beneath orange red; inside of limbs slightly vermiculated with yellow. Skin of upper parts rather rough, coriaceous; a white granular ridge on each side. Length 3½ inches.

Habitat. Kaduganava, Kandyan Province.

I have only seen two specimens of this rare frog.

FAM. HYLIDÆ. *Tree Frogs.* GHAS ATTY KITTA. *Sing.*

GENUS. LIMNODYTES. *Dum. et Bib.*

Tongue long, narrowed in front, widened, forked, free behind; the teeth on the vomer forming two groups, between the internal openings of the nostrils; tympanum distinct; Eustachian tubes middling, fore fingers free; toes completely or partly webbed; subdigital disks slightly dilated; process of the first os cuneiforme blunt, very minute; males with vocal sacs; sacral transversal processes not dilated.

LIMNODYTES MUTABILIS. *n. s., nobis.*

Upper parts very changeable; generally, of a bright green above and yellow beneath; a red line on the outer edge of limbs; sometimes of a dark chesnut on the upper parts, and variegated with yellow and green on the sides and limbs.—Of a more slender form than the common tree Frogs *Polypedates cruciger*, and *P. Leucomystax.* About 2 inches long.

Habitat. Cinnamon gardens; Cotta near Colombo. If not mistaken, we have also seen this elegant frog at Nuwera Ellia. In spirits the colours fade into a pale leaden hue; the red streak on the limbs disappears last.

LIMNODYTES MACULATA. *n. s., nobis.* *

Brown, spotted and streaked with black or dark brown; beneath pale, seldom spotted. About 1¼ inch long.

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* I have received from Dr. Webb a Tree frog, 2¼ inches long, having the diagonal black marks of *Polypedates cruciger* of Blyth; but, unlike it,

Habitat. Galle, Southern Province.

I believe this species to be generally distributed, but have before mistaken it for the young of *Polypedates Leucomystax.*

FAM. BUFONIDÆ. *Toads.* GAMEDEA, *Sing.*

GENUS. ENGYSTOMA. *Gray.*

No tympanum nor parotid visible externally; an oval body; the head and mouth very small, and feet but slightly palmated.

ENGYSTOMA RUBRUM. *n. s., Jerdon.*

Synon. Engystoma cinnamomea. M. S. *n. b.*

Cinnamon red, spotted black; limbs also spotted; belly whitish. Length (young) 1½ inch.

Habitat. Southern India (?) Ceylon.—

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this frog is maculated above and beneath, and the posterior sides of thighs are also spotted. White granular spots around the anus. Sides of body yellowish, spotted. Throat white, dotted with black. If Dr. Webb's specimen is of a distinct species, the two other (young) specimens of a very dark brown colour, spotted, with a pale back, are perhaps of the same species. In another (also young) the space, marked like an hour glass, on the back, is of a jet black colour. I am more inclined to believe that all these are different phases of the new species, named by Mr. Blyth, *Polypedates cruciger.*

ADDENDA.

ORDER. SAURA.

TRIBE. GEISSOSAURA.

FAM: SCINCIDÆ, *Scinc.*

EUMECES TAPROBANENSIS, *nobis.*

Above dark brown, with 6 lines of black dots on the back. Sides of neck and body of a darker brown, minutely dotted white; a few white dots also on the limbs. Beneath whitish. Upper surface of tail of the same colour as the body; under surface dark grey, each scale with a large blackish spot. Head short, subtriangular; muzzle narrow, rounded. Nostril pierced on the upper edge of nasal plate. Eyes large, eyelids scaly, edges lightly granular; lower lid with a series of larger scales. Ears small, circular, dentated anteriorly by two or three scales. Body rather short, subcylindrical. Tail elongated, rounded, tapering, pointed. Limbs 4, small, not wide apart. Toes 5-5, short, unequal, tubercular beneath, clawed. Palms and soles granular.

Head and body, 1. 7-10 inches.

Tail, 2. 6-10 inches.

Found at Newera Ellia by Dr. Webb, Staff Assistant Surgeon. This Scinc resembles in colour and in its elongated form the Lizard which I have identified with *Nessia Burtonii.*

ORDER BATRACHIA.

FAM: HYLIDÆ.

POLYPEDATES (?) SCHMARDANA, *n. s.*, *nobis.*

Above brownish grey; beneath white, posterior half of abdomen marbled with black. Eye-brows armed with spines. Back and sides tuberculated. Limbs studded with tubercular sharp pointed spines. About 1½ inch long.

Hab. Adam's Peak.

This novel form of Tree Frog was first found on Adam's Peak by Dr. Schmarda, Professor of Zoology in the University of Prague, to whom I have dedicated this species. It has no resemblance to any other found in Ceylon or Southern India.

Mr. Blyth has recently described three new species of Frogs from my Ceylon collection. J. A. S. B., vol. 1854.

RANA ROBUSTA, *n. s.*, *nobis.*

A moderately large Frog from Ceylon. Limbs exceedingly thick and massive; the third-digits fully webbed. Skin subgranulose, especially on the lower parts. A slight transverse fold on the breast. Colour dusky above, with a large black patch on the back, another on the croup, and smaller lateral patches. Lower parts yellowish-white, with a V-like mark on the lower surface of the thigh in one of two specimens, both males. The same individual has dusky spots or imperfect streaks on the lower surface of the thigh, and its posterior surface is marked with longitudinal streaks of alternating black and yellowish white. Digital membrane speckled with black. Length from snout to vent 3 in., and of hind limb 4 in., of which the foot is half. Presented by Dr. E. F. Kelaart.

Lymnodytes Maculariüs, *n. s.*, *nobis.*

Differs from L. Erythræus by the slightly but distinctly papillose skin of the back, and non-verrucose posterior surface of thighs; by its shorter and stouter limbs, and short anterior digits, the two outermost of which have their terminal disks smaller than in L. Erythræus. There is a broad black band from nostril to loin, bordered above and below by narrow pale yellow streaks. Entire lower parts spotless light yellow, as also the upper lip. A black spot at the shoulder, and line along the posterior surface of the fore limb. One or more similar lines on the hind limbs; the thighs beautifully mottled with black; and a black medial line along the back, which becomes double over the loins. Length of male from muzzle to vent 2⅜ in.; of hind limb 3¾ in.; of which the foot measures 1¾ in. Hab. Ceylon. Dr. E. F. Kelaart.

Lymnodytes Lividus, *n. s. nobis.*

A large species with short and remarkably fleshy thighs. Colour dusky above, paler and tinged with ruddy on the sides which are spotted with black. Chin, throat, and breast, minutely variegated pale and dusky. Belly and thighs underneath, sullied whitish. Above, the thighs and shanks are paler than the back and tinged with ruddy, having several dusky cross-bands. Posterior surface of thigh smooth or non-verrucose. Length from muzzle to vent 3¼ in., and of hind leg 4½ in., of which the foot is 2¼ in. From Colombo. Dr. E. F. Kelaart.

CEYLON ORNITHOLOGY

In order to place before the Ceylon student of Natural History a systematic account of the Genera of Birds, I have extracted for their use descriptions of the Genera of Ceylon Birds from the celebrated work of Gray and Mitchell, which from its costly character is beyond the reach of many.

My descriptions of Ceylon Birds formed originally part of a work contemplated by Mr. Layard and myself: the former undertaking to write an account of the habits of the birds. But owing to Mr. Layard's unexpected departure from Ceylon in search of health, we are not able to work together. Therefore, I can only promise to bring before the public, descriptions of birds which I have either seen or examined. And with a view of making the paper more complete, I shall add from authentic sources descriptions of other birds, of which I have not at present any specimens to describe from.

It will also be my endeavour to describe the habits of some of the birds which have come within the limited field of my own observation, trusting that at no distant time some Field Naturalist will finish the work now begun.

Gray's Genera of Birds adapted to Ceylon Ornithology.

ORDER. I. ACCIPITRES.

This order embraces the Birds of Prey; they have the *bill* of various length and form, more or less compressed, with the *culmen* suddenly hooked at the tip, and acute: the base more or less covered with a *cere*, in which are pierced the variously formed nostrils; the *wings* lengthened and pointed; the *feet* strong, with *tarsi* moderate, generally rounded and covered with scales of different shapes; the *toes* three before and one behind, all armed with strong *claws*, and their soles invariably rough.

The first Sub-Order

ACCIPITRES DIURNI, *or Diurnal Birds of Prey*,

are distinguished from those that pursue their food in the twilight or at night, by the lateral position of their *eyes:* the base of the upper mandible covered for nearly half its length with a prominent *cere*, in which the nostrils are placed: the *tarsi* moderate, scaled, and rarely covered with plumes.

FAM: FALCONIDÆ.

SUB-FAM: AQUILINÆ, or EAGLES.

GENUS. AQUILA. *Mœhr.*

Bill strong at the base, and with the apical portion of the *culmen* much curved to the tip, which is greatly hooked and acute: the sides much compressed, and the lateral margins festooned; the *nostrils* placed at the *cere*, large, and rather oblique. *Wings* lengthened and acute, with the fourth and fifth quills equal and longest. *Tail* long and wedge-shaped, or rounded at the end. *Tarsi* rather longer than the middle toe, robust, and entirely clothed to the base of the toes with feathers. *Toes* moderate, strong, lateral ones unequal, and all armed with strong, curved, acute claws: the inner the strongest.

GENUS. SPIZAËTUS. *Vieill.*

Bill moderate, the *culmen* straight at the base, and much arched to the tip, which is acute and compressed, and the lateral margins festooned; the *nostrils* large and rather rounded. *Wings* moderate, reaching to half the length of the tail, with the fourth and fifth quills equal and longest. *Tail* long and slightly rounded at the end. *Tarsi* slender, much longer than the middle toe, and plumed to the base of the toes. *Toes* long, strong, the inner one much longer than the outer, which is united to the middle one by a membrane: all covered above with small scales except at the apex, where there are a few transverse ones, and each toe armed with a long, strong, curved and acute claw.

GENUS. CIRCAËTUS. *Vieill.*

Bill moderate, *culmen* at the base straight, and much curved to the tip, which is hooked and acute, the lateral margins festooned; the *nostrils* large, oblique, and suboval. *Wings* lengthened and acute, with the third and fourth quills equal and longest. *Tail* long and even. *Tarsi* much longer than the middle toe, feathered below the knee, and entirely reticulated. *Toes* short, strong, and covered with small scales, except at the tips; the outer united to the middle by a membrane; the *claws* long, curved, and acute.

GENUS. HALIAËTUS. *Sav.*

Bill large, *culmen* straight at the base, and curved to the tip, which is hooked and acute, the sides compressed, the lateral margins slightly festooned, and the lores naked; the *nostrils* moderate, linear, and oblique. *Wings* lengthened and acute, with the third, fourth, and fifth quills nearly equal and longest. *Tail* moderate and rounded, *Tarsi* short, strong, covered in front with transverse narrow scales, and with small irregular ones posteriorly, and on the sides. *Toes* long, mostly covered above with transverse scales; the claws long, curved, and acute.

GENUS. PONTOAËTUS. *Kaup.*

The characters of Haliaëtus, except that the *tarsi* are covered in front with transverse scales, posteriorly with large irregularly placed scales, and on the inner side with small ones. *Toes* almost entirely covered above with transverse scales.

GENUS. HALIASTUR. *Selby.*

Most of the characters are similar to those of Haliaëtus; but the *tarsi* are covered in front with large obliquely placed scales, posteriorly with large irregular scales, and the sides with small ones.

SUB-FAM: FALCONINÆ, TRUE FALCONS.

GENUS. FALCO. *Linn.*

Bill short, strong, with the *culmen* much arched from the base to the tip, which is acute: the sides compressed, the lateral margins strongly toothed near the tip; the *nostrils* placed in a short cere, naked and rounded, with a central tubercle. *Wings* lengthened and acute, with the second and third quills the longest, and the first and second notched near the tip. *Tail* long and rounded. *Tarsi* short and strong, covered with small irregular scales, and the tibial feathers covering the knee. *Toes* lengthened and strong, the lateral ones unequal; the hind toe long, armed as well as the inner with a strong, hooked, acute claw.

GENUS. HYPOTRIORCHIS. *Boie.*

The characters in common with Falco; but the *tarsi* more or less lengthened, somewhat slender, and covered in front with large hexagonal scales. *Toes* very long and slender.

GENUS. TINNUNCULUS. *Vieill.*

The forms agree with those of Falco. But the *tarsi* are more or less lengthened, strong, and covered in front with large transverse hexagonal scales. *Toes* moderate and strong.

SUB-FAM: MILVINÆ, or KITES.

GENUS. BAZA. *Hodgson.*

Bill moderate, elevated at the base, which is broad, the sides compressed, the *culmen* much arched, and the lateral margins furnished with two small teeth near the tip, the lower mandible also furnished with small teeth near the tip; *lores* clothed with small feathers; the *nostrils* placed in the *cere,* in the form of an oblique slit. *Wings* lengthened, nearly reaching to the end of the tail, with the third and fourth quills the longest. *Tail* long and broad. *Tarsi* thick and very short, longer than the middle toe; basal half plumed, and the other part covered with small scales. *Toes* thick, free at their base, the inner longer than the outer; the claws small and acute,

GENUS. MILVUS. *Cuv.*

Bill laterally compressed, the *culmen* straight at the base, and then much curved to the tip, which is acute, the lateral margins somewhat straight; the *nostrils* oval, and placed rather obliquely in the cere. *Wings* very long, with the third and fourth quills the longest. *Tail* very long, broad, rounded, or more or less forked at the end. *Tarsi* very short, partly plumed from the base, and the rest covered with scales. *Toes* rather short, with the outer united at its base to the middle one, the *claws* long and curved.

GENUS. ELANUS. *Sav.*

Bill short, very broad at the base, and compressed towards the tip, which is hooked and acute; the *nostrils* large and suboval. *Wings* very long, pointed, and reaching beyond the tail, with the second quill the longest. *Tail* long, and slightly emarginated. *Tarsi* short, nearly the length of the middle toe, with the basal part plumed, and the other covered with reticulated scales. *Toes* moderate, broad, and free at the base, with the outer much shorter than the inner toe; the *claws* strong and curved.

SUB-FAM: ACCIPITRINÆ, or SPARROW HAWKS.

GENUS. ASTUR. *Lacep.*

Bill short, broad at the base, and with the sides gradually compressed to the tip; the *culmen* elevated, and much arched to the tip, which is acute, and the lateral margins festooned in the middle; the *nostrils* large and suboval, and placed in the basal cere. *Wings* long, reaching to the middle of the tail, with the third, fourth, and fifth quills nearly equal, and longest. *Tail* long and broad. *Tarsi* rather longer than the middle toe; the anterior and posterior sides covered with broad transverse scales. *Toes* more or less lengthened, strong, and padded beneath each joint; the lateral toes unequal; the inner and hinder ones equally long and strong, and armed with long, strong, and curved claws.

GENUS. ACCIPITER. *Kriss.*

Bill very short with the *culmen* much arched to the tip, which is acute; the sides much compressed, and the lateral margins festooned; the *nostrils* placed anteriorly in the cere, large and suboval, partly concealed by the projecting hairs of the lores. *Wings* moderate, with the fourth and fifth quills nearly equal, and longest. *Tail* long, ample, and nearly square at the end. *Tarsi* longer than the middle toe, covered in front with nearly obsolete scales. *Toes* more or less lengthened, and padded beneath the joints; the lateral ones unequal, and the inner and hind toes equal in length, and both with a strong curved claw.

SUB-FAM: CIRCINÆ, or HARRIERS.

GENUS. CIRCUS. *Lacep.*

Bill moderate, elevated at the base of the culmen and arched to the tip, which is hooked; the sides compressed, and the lateral margins festooned; the *nostrils* large, oval, and partly concealed by the curved hairs of the bases. *Wings* long, with the third and fourth quills nearly equal and longest. *Tail* long and rounded on the sides. *Tarsi* long, slender, and compressed, the outer side covered with transverse scales, and the inner with small scales. *Toes* moderate, with the outer one longer than the inner; the *claws* long, slender and acute.

SUB-ORDER. ACCIPITRES NOCTURNI.

Nocturnal Birds of Prey.

FAM: STRIGIDÆ, or OWLS.

SUB-FAM: SURNINÆ, or HAWK OWLS.

GENUS. ATHENE. *Boie.*

Bill short, partly concealed by the projecting plumes, the sides compressed, the *culmen* much arched to the tip, which is hooked and acute; the *nostrils* basal, lateral and hidden by the frontal plumes. *Wings* rather long and rounded, with the third and fourth quills the longest. *Tail* moderate and nearly even. *Tarsi* longer than the middle toe, and covered with plumes. *Toes* short, and covered with scattered hairs; the *claws* long, arched and acute.

SUB-FAM: BUBONINÆ, or HORNED OWLS.

GENUS. EPHIALTES, *Keys, and Bl.*

Bill moderate, the base concealed and broad, the sides compressed, with the *culmen* flattened at the base, and curved to the tip, which is hooked; the lateral margins curved; the *nostrils* rounded, placed in the forepart of the cere, and covered by the basal plumes. *Wings* long, with the second, third and fourth quills nearly equal and longest. *Tail* short, and more or less even. *Tarsi* rather long, and covered with short plumes to the base of the toes. *Toes* long, covered with small scales at the base, and with three or four transverse scales at the tip; the *claws* moderate, strong and curved.

GENUS. KETUPA. *Less.*

Bill large, broad at the base, compressed towards the tip, which is hooked, the lateral margins slightly arched: the *nostrils* lateral, placed in the anterior part of the cere, and hidden by the projecting plumes. *Wings* moderate, with the third and fourth quills equal and longest. *Tail* short, and nearly even at the end. *Tarsi* rather long, covered at the base with down, and towards the tips with minute scales. *Toes* moderate, strong, covered with small scales, except at the tips which are furnished with three or four transverse scales, the lateral toes unequal, the *claws* long, strong and curved.

SUB-FAM: SYRNIINÆ, or OWLETS.

GENUS. SYRNIUM. *Sav.*

Bill moderate, strong, with the base broad, and concealed by the frontal plumes; the sides compressed, and the culmen arched to the tip, which is hooked; the *nostrils* basal, lateral, and medial, with the opening large and oval. *Wings* long and rounded, with the fourth and fifth quills equal and longest. *Tail* long, broad, and more or less rounded. *Tarsi* short, strong, thick, and densely clothed with plumes. *Toes* moderate, densely plumed to the end of each toe, the *claws* long, acute, and slightly curved.

SUB-FAM: STRIGINÆ, or OWLS.

GENUS. STRIX. *Linn.*

Bill long, mostly concealed at the base by the projecting plumes; the sides much compressed, and the culmen arched to the tip, which is acute and hooked; the *nostrils* large, party covered by a membrane, with the opening oval, and slightly hidden by the hairs. *Wings* very long, with the second quill the longest. *Tail* short and generally even. *Tarsi* much longer than the middle toe, slender and covered with short soft plumes. *Toes* long, and covered with scattered hairs; the lateral ones unequal, the outer much shorter than the inner; the hind toe short and thick; the *claws* long, curved and acute.

DESCRIPTION

OF

BIRDS OF CEYLON.

ORDER. ACCIPITRES.

SUB-ORDER. ACCIPITRES DIURNI.

Diurnal Birds of Prey.

FAM: FALCONIDÆ.

a. AQUILINÆ.

AQUILA BONELLII, *Temm.* The Genoese Eagle.

Syn. Aquila intermedia, *Bonelli.*
Aquila fasciata, *Vieill.*
Nisaëtus grandis, *Hodgson.*

Uniform dark brown above, white beneath with dark brown longitudinal streaks on the chin, throat and breast; upper part of inner web of primaries streaked and spotted with white. Tail slaty blue with darker transversal bands, tip palish; under tail coverts white, irregularly barred with rufous brown. Thighs barred with rufous brown. Bill horn colour, cere yellow, tarsi yellow, claws black.

The only specimen of this Eagle examined is one found by Dr. Templeton, it measured 2 feet 3 inches; closed winged, 1 foot 6 inches. *Habitat* not known.

AQUILA PENNATA, *Gmel.* The Pennated Eagle.

Syn. Aquila minuta, *Brehm.*
Spizaëtus milvoides, *Jerdon.*

Head and neck light rufous brown with dark medial streaks. Back, wings, and upper surface of tail dark brown. Under parts white, breast and lower part of neck streaked with rufous brown; shafts of feathers of a darker shade. Under wing coverts white, shafts brown, a few brown spots on the outer ones. Upper tail coverts rufous with whitish tips and margins. Extreme tip of tail pale. Thighs and legs white, indistinctly spotted light rufous. Bill slaty blue; toes yellow; claws black. Length 1 foot 6 inches. Wing 1 foot 3 inches.

Shot at Point Pedro by Mr. Edgar Layard. This is one of our rarest indigenous birds of prey.

AQUILA MALAYENSIS, *Reinw.* The Black Eagle.

Syn. Aquila pernigra, *Hodgson.*
Neopus perniger, *Hodgson.*
Nisaëtus? ovivorous, *Jerdon.*
Ictinaëtus Malaiensis, *Blyth.*

Uniform black above, rather dusky below (a few white spots scattered on the body and tail of the specimen examined). Tail barred with broad brownish bands. Bill blue with black tip, cere yellow. Toes yellow, claws black. Irides brown. Occipital crest black. About 2 feet 6 inches long.

This is also a rare bird of prey in the Island. One or two only are occasionally seen on the Kandyan Hills. The specimen we have examined was procured by Mr. Charles Kelaart, at Kaduganava.

SPIZAËTUS NIPALENSIS, *Hodgson*, *Gray*. The Beautiful Crested Eagle.

Syn. Nisaëtus Nipalensis, crested var. young. *Hodg.*
Nis. pulcher, adult, *Hodg.*
Falco orientalis? } *Temm. et Schlegel.*
Falco lanceolatus? }

Head and neck brown; the cheeks and chin have a triple longitudinal marking of brown. Thighs, tarsi and inferior tails coverts transversely barred with dark fawn. A graceful pendant crest, composed of plumes of a brown colour. Bill blue at the base, black at the tip; the cere greenish yellow, the iris golden; the toes yellow, and the nails black. *Hodgson.**

The above description is evidently of a young bird. An adult specimen which I sent to Mr. Blyth has been identified by that Naturalist with *Sp. Nipalensis.* This beautiful Eagle is rarely seen, and that, too, only on the Alpine parts of the Island. The only specimen I was so fortunate as to secure is now in the Museum of the Asiatic Society of Bengal. It is 30 inches long.

SPIZAËTUS LYMNAËTUS, var. *Horsf.* The Common Crested Eagle.

Syn. Falco cirrhatus, *Gmel.*
Falco cristatellus, *Temm.*
Falco caligatus, var. *Raffles.*
Falco niveus, var. *Temm.*
Nizaëtus Nepalensis, crestless var. *Hogdson,*

This Eagle is seen of several shades of colour and markings. Two most distinct varieties are seen in Ceylon, one much darker than the other and with a more developed crest. The darker variety may be thus described.

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* The whole of the under parts, from the head downwards, were beautifully barred rufous in the Ceylon specimen.

Hair brown above, white beneath. Head and neck of a rufous brown with narrow blackish mesial streaks. Chin, throat, and under part of body marked with broad dark rufous brown longitudinal streaks. Tail barred broadly. Under surface of alar and tail quills white and barred with dark brown. Under tail coverts rufous. Under wing coverts white and spotted dark brown. Thighs rufous and barred with pale white. Tarsi white and freckled with brown. Occipital crest black with white tips, 4 inches long. Length 1 foot 10 inches. Wing 13 inches.

The above characters correspond closely with Mr. Blyth's description of a specimen of this Eagle received from Midnapore. (J. A. S. B. vol. 1845, page 175).

The paler and more numerous variety, is not unlike Falco niveus, *Temm.*

White predominating. Head and neck pale white or rufous with narrow mesial streaks of a more or less dark rufous colour. Base of dorsal feathers white and the tips of some of the longer ones also white. The cheeks, chin and throat immaculate. Breast and abdomen with a few rufous spots and mesial streaks. Thighs indistinctly spotted with light rufous. Tarsi white, immaculate. Occipital crest composed of white and black plumes, some of the latter also white tipped. Rather smaller than the dark variety.

There is also a crestless variety of this species, in colour resembling the last described bird.

The crested variety is rather abundant at certain seasons of the year in all the Maritime provinces and lower Kandyan Hills. It is a bold and powerful bird, attacking full grown fowls in the native villages. In the Northern provinces they are frequently seen on the topmost branches of the Banyan tree, where the nests of crows furnish them with dainty food. At Kaduganava this Eagle is often seen soaring above Dawson's monument, sometimes alighting on its summit to devour its prey; it is not however a very common bird on the Kandyan Hills. I procured only a few specimens from

Kandy and Trincomalie, whereas, as many as seven were shot by Mr. Layard on one tree in the Court yard at Point Pedro.

PONTOAËTUS LEUCOGASTER, *Gmel.* The White Bellied Sea Eagle.

Syn. Falco leucogaster, *Gmel.*
Falco Blagrus, *Daudin.*
Falco dimidiatus, *Raffles.*
Falco albicilla, var. *Latham.*
Ichthyaëtus cultrungis, *Blyth.*
Haliaëtus sphenurus, *Gould.*

Head, neck, and abdomen white. Back and wings ashy brown, primaries nearly black; most part of the inner web of secondaries white. Anterior two-thirds of tail dark brown, the rest white. Upper tail coverts brown, slightly tipped with white; lower white throughout; shorter lower wing coverts white, with a few ashy splashes; longer ones ashy brown. Thighs white. Tarsi and toes yellow, claws black. Bill bluish. Length 3 feet 5 inches. Wing 1 foot 9 inches.

This is the largest of our Ceylon Birds of prey, common on the Northern Coasts, rarely seen on the South-Western parts of the Island; very abundant at the Salt lakes of Hambantotte, and the Bay of Calpentyn. Mr Layard writes, "In fact, wherever there is much shallow salt water, particularly if the receding tide leaves bare a large extent of mud, there will this Sea Eagle be found fishing in company with *Haliastur Indicus* and *Milvus Govinda.* Unlike them, however, the Fish Eagle prefers living prey to garbage, and is particularly destructive among the sea snakes, which are very abundant in the sea between Point Pedro and Point Calamanar on the opposite coast. We have frequently seen this bird capturing its prey. It keeps soaring very high, and then descends very rapidly, with its wings half closed and upraised, its legs pendant, and its body swaying to and fro, like the weight attached to a parachute. When close to the object of its pursuit, the legs are suddenly darted out, the prey seized near the head, the fall arrested, and without touching the mud or water, the noble bird soars upwards with its victim writhing in its claws. If it fails to kill the eel or snake when on high, the booty is dropped, and we have often secured a good specimen of marine snake from this mishap of the bird."

"The Sea Eagle constructs a large nest (to which it adds yearly) among the branches of some large tree, generally an aged Bo-tree (*Ficus religiosa*) is selected, and owes its security to the superstitious fears of the ignorant natives, who, in spite of all our promised reward, have invariably refused to ascend the trees, alleging that the guardian demons of the sacred tree would hurl them headlong down if they attempted to climb the tree for such profane purpose as robbing a bird's nest. We have, therefore, as our own climbing days are over, never been able to procure the eggs of this species." [Mr. Layard in MS.]

PONTOAËTUS ICHTHYAËTUS, *Horsf.* Brown Tank Eagle.

Syn. Falco Ichthyaëtus, *Horsf.*

Plumage in general brownish; quills deep brown; head grey; chin whitish; neck brownish grey; breast and belly pale ferruginous brown; lower part of the latter, the vent and thighs white; tail dusky at the tip. Length 2 feet 4 inches. *Latham*.

The only specimen secured by Mr. Layard is now with Mr. Blyth.

Found in the large tanks in the Northern parts of the Island.

CIRCAËTUS CHEELA, *Latham.* The Undulated Bacha.

Syn. Falco cheela, *Latham* and *Gmelin.*
Hæmatornis undulatus, *Vig.*
Circaëtus Nepalensis, *Hodg.*
Falco albidus, *Temm.*
Falco Bacha, *Daudin.* (African Race.)
Falco Bido, *Horsf.* (Malabar Race).

Head black, occipital crest tipped white or fulvous. Back fuscus brown. Small wing coverts spotted white. Upper tail coverts tipped white. Neck and breast dark rufous brown with palish tips. Abdomen, lower wing and tail coverts rufescent and spotted with small round white spots, (a blackish ring round some of the white spots). Wings and tail barred broadly with black and cream colour. Tip of tail feathers whitish. Thighs rufescent and spotted with white ocelli. Length 1 foot 10 inches. Wing 1 foot 2 inches.

Very common in the Northern parts of the Island. Rarely seen on the Kandyan Hills. There is a lighter coloured allied species, found at Trincomalie, which Mr. Blyth has named

HÆMATORNIS SPILOGASTER, *Blyth.*

In this species the tips of all the feathers of the head and neck are more broadly tipped with fulvescent white. The breast and abdomen of a lighter rufous colour, and more thickly spotted with white. Mr. Blyth in describing this new species, which I considered only a local variety of *C. Cheela*, observes, that "it is rather smaller than *H. Cheela*, (Latham, *vel H. undulatus*, Vigors) and remarkable for having the under parts as in the adult of that species, while the upper parts, throat and tail retain in the adult the same colouring as that of the young of *H. Cheela*, a phase of plumage which we have never seen among the multitude of Bengal specimens of *H. Cheela* examined, but which is exhibited in the two now received from different parts of Ceylon." Irides yellow.

There is another specimen in my possession which cannot be referred to either *H. Cheela* or *H. Spilogaster*, and which I shall now describe.

CIRCAËTUS, (?) *Sp.; probably new.*

Upper parts like *H. Spilogaster.* Breast with broad dark rufous brown drops, and rufous mesial lines on the outer abdominal feathers. Ventral, lower tail coverts and thigh feathers barred with rufous. Lower wing coverts brown, and ocellated with white. Tail and wing quills as in *H. Cheela.* Bill yellow, with blackish tip. Feet yellow. Irides golden. Length 2 feet 1 inch. Wing 1 foot. Found at Trincomalie in company with *H. Spilogaster.*

HALIASTUR INDUS. *Bodd.* Shiva's Fishing Eagle.

Syn. Falco Indus, *Boddaert.*
Falco Ponticerianus, *Gmelin.*
Haliaëtus girrenara, *Veillot.*
Haliaëtus garruda, *Lesson.*
Milvus rotundicaudatus, *Hodg.* (young.)

Head, neck, and breast white with narrow brown mesial streaks. Back, tail, legs, and under tail and wing coverts bright rufous chesnut. Shafts of dorsal feathers, and upper wing coverts black. Wing rufous, with the exception of the outer quills, which are blackish. Bill pale yellow at the tip. Irides pale yellow. Tarsi and toes pale yellow. Claws black. Length 1 foot 5 inches. Wing 1 foot.

This handsome Eagle is found with the common Fishing Kite *(Milvus Govinda)* in all the Maritime provinces, and very abundant at Trincomalie and Jaffna; as many as twenty or thirty are sometimes seen together. Although fish is their favourite food, they are not unfrequently seen to eat carrion, or even to carry away poultry.

SUB-FAM: FALCONIDÆ.

FALCO PEREGRINUS, *Linn.* The Peregrine Falcon.

Syn. Falco barbarus, *Linn.*
Falco communis, *Brisson.*
Falco calidus, *Latham.*
Falco lunulatus, *Daudin.*

Upper parts ashy. Head and neck shaded with white; a black patch under the eye. Beneath white with brown or blackish streaks. Wings ashy, inner web of quills barred with white, or rufescent white, upper wing coverts and scapularies, white or rufescent. Under wing coverts white, and barred with brown. Tail and upper tail coverts, ashy brown with white transverse bars; tip white. Bill bluish. Tarsi and toes yellow; claws black. *Female.*

Males are darker throughout and blackish on the head. Dorsal feathers spotted and barred with black.

Length 1 foot 4½ inches. Wing 1 foot.

This widely distributed Falcon is found in the Northern and North-Eastern Provinces. Seldom more than a pair seen at a time. They are generally found on open plains in search of birds and small reptiles.

FALCO PEREGRINATOR, *Sundeval.* The Shaheen Falcon.

Syn. Falco shaheen, *Jerdon.*
Falco sultaneus, *Hodgson.*

My indefatigable friend Mr. Edgar Layard obtained a specimen of this elegant Falcon in Saffragam near the foot of Adam's Peak, but which I have not had the pleasure of inspecting.

The young male of this bird is thus described by Dr. Jerdon.

Young male. Plumage above generally of a dark cinereous or dusky blackish hue, darkest on the head, hind neck and cheek striped; most of the feathers are narrowly edged with rufous, those on the lower part of the back and rump more broadly so. There is some rufous on the forehead, and on the back of the head where it forms a sort of crucial mark. Tail paler than the rest of the body, faintly barred with rufous, and tipped the same. Chin and throat pale rufous yellow, unspotted; cheeks of the same tint, with narrow dark stripes. The rest of the plumage beneath bright rufous or chestnut, with longitudinal dark brown markings on the centre of the body, oblong spots on the sides, and arrow-shaped markings on the lower part of the abdomen. Under wing coverts, rufous, barred with brown; quills barred with rufous on their inner webs. Bill bluish, darker on the tip; cere and orbitar skin pale yellow; irides dark brown; legs and feet yellow. Length 15 inches. Wing 11 inches. Tail 5½ inches. Tarsus nearly 2 inches. Centre toe and claw 2½ inches. Weight 1lb.

The young female "differed from the male in having the chin, throat and cheeks white, in the rufous edgings to the feathers being very indistinct, and the plumage generally being of a darker hue."

"After the first moult, the markings of the lower surface disappear, except a few on the lower part of the abdomen and leg feathers, the plumage above becomes more of a bluish tinge, and the edgings and barrings disappear; with further moultings, the shade of the plumage above becomes still lighter, and of a slaty blue, the markings beneath vanish entirely, and the rufous tint of the breast becomes paler."

This handsome Falcon "is found throughout the whole of India, from the Himalayas to the extreme south of the Peninsula. It is well known to native Falconers." In Ceylon we presume it is a rare bird, as Mr. Layard only met with one specimen during his eight years' residence in the Island.

TINNUNCULUS ALAUDARIUS, *Brisson.* The Kestrel Falcon.

Syn. Falco alaudarius, *Brisson.*
Falco Tinnunculus, *Linn.*
Falco fasciatus, *Reszius.*
Falco bruneus, *Bechotim.*
Falco rufescens, *Swainson.*
Falco interstinctus, *Mc Clelland.*

Head and neck pale ash with blackish shafts. Cheek paler, a darker streak from the mouth downwards. Back and upper wing coverts cinnamon brown with triangular black spots at the terminal edge of feathers. Wing quills brown, inner web dentilated with white. Under parts of body pale rufous, with black streaks and spots. Under wing coverts white with brown spots. Tail ashy grey with black subterminal band and white tip. Bill bluish, tip black. Irides yellow. Tarsi and toes yellow. Claws black. Length 1 foot 2 inches. Wing, 9½ inches. The female is a more elegant bird and differently maculated.

Upper parts rufescent with dark brown streaks on the head, and blackish bars on dorsal feathers and upper wing coverts. Breast and abdomen rufescent white with brown mesial streaks. Wings dark brown or blackish above and whitish beneath; inner web of quills barred, zigzag white or rufous; lower wing coverts white with small brown spots. Tail rufous, with blackish bars, and a broad black subterminal band; tip whitish. Rather smaller than the male.

The Kestrel, a well known bird of Europe and America, is also very common in India and Ceylon. I have found it in all the Maritime provinces, and also at Kandy and Newera Ellia. They are frequently seen in pairs on open plains in search of field rats, toads, and the young of *Monitor Dracæna.* I have found the Kestrel's nest on the rocks of Trincomalie, and also on the sea-girt batteries of that old Fort.

HYPOTRIORCHIS CHICQUERA, *Shaw.* The Small Red-Headed Falcon.

Syn. Falco ruficollis, *et* Falco macrodactylus. } *Swainson.*
Falco cirrhatus, *var.* Fasciated Falcon. } *Latham.*

Head and upper parts of neck dark rufous, under parts of neck white. Back ashy grey. Breast, abdomen, lower tail coverts and thighs white, with dark ashy bars. Wing dark ashy brown; inner web of quills white with ashy bars. Upper wing coverts ashy and minutely barred brown; lower wing coverts white and barred with brown. Tail ashy above with narrow transverse streaks, paler beneath. Tip whitish and a broad subterminal band. Bill yellow, with black tip. Tarsi and toes yellow; claws black.

Length 11½ inches. Wing 7½ inches. A pair of this beautiful Falcon were seen by Mr. Layard at Point Pedro, where even it is a very rare bird.

SUB-FAM: MILVINÆ.

ELANUS MELANOPTERUS, *Daudin.* Black-Winged White Kite.

Syn. Falco clamorus, *Shaw.*
Falco mèlanopterus, *Daudin.*
Falco vociferus, *Latham.*
Elanus cærius, *Savigny.*

Above ashy white. Beneath white. Upper wing coverts and ridge black. Tail white, middle feathers greyish. Bill black. Tarsi and toes yellow. Claws black. Irides orange, a black superciliary streak.

Length 1 foot. Wing 10 inches.

This dove-like Falcon is very rare in the Island. I have only one specimen of it from Kandy, and Mr. Layard shot only one near Jaffna.

MILVUS GOVINDA, *Sykes.* The Cheela or Govinda Kite.

Syn. Milvus cheele, *Jerdon.*
Milvus melanotus. *Temm.*
Hiliaëtus lineatus, *Gray.*
Falco ater? *Gmelin.*
Falco niger? *Brisson.*

Dark brown, with a rufescent shade, edge of feathers pale. Beneath with darker mesial streaks. Tail slightly forked, indistinctly barred blackish. Bill black. Tarsi and toes yellow. Claws black.

Length 1 foot 10 inches. Wing 1 foot 4 inches.

This Kite is very common in all the Maritime provinces. I have not seen it on the hills. It feeds chiefly on fish, and the fishermen with difficulty keep these rapacious birds from stealing fish from their nets. As the fishing boats draw near the shore, hundreds of these Kites are sometimes seen to hover around and manage to get a good feed, with very little exertion on their part, in spite of all the resistance the industrious fishermen can offer.

BAZA LOPHOTES, *Temm.* The Cohy Falcon.

Syn. Baza syama, *Hodgson.*
Falco lophotes, *Temm.*
Lophotes Indicus, *Lesson.*

Head black with a crest composed of a few long black feathers. Chin and neck black. Breast rufous, white barred. Abdomen and vent black. The whole of the upper parts black. Wing black with a greenish shade; scapularies rufous and partly white and black. Bill greenish yellow. Tarsi and toes greenish.

Length 12¼ inches. Wing 9 inches.

The only specimen I have seen of this small black crested Falcon was a preserved one in Mr. Layard's collection, which he shot, I believe, in the Wanny district.

SUB-FAM: ACCIPITRINÆ.

ASTUR TRIVIRGATUS, *Temm.* The Indian Goshawk.

Syn. Astur cristatus, *G. R. Gray.*
Astur Indicus, *Hodgson.*
Astur palumbarius, *Jerdon.*
Spizaëtus rufistinctus, *Mc Clell.*

I do not remember seeing a specimen of this bird in Ceylon. Mr. Layard says he saw a live one at Anarajapoora, and I believe, Mr. Blyth received a preserved specimen of this Hawk from Ceylon.

The following is the original description of McClelland's bird. (*Spizaetus rufistinctus*), which Mr. Gray makes a synonym of *Astur trivirgatus* of *Temm.*

Upper part of the body dark brown, with slight undulations of a deeper tint, breast and throat longitudinally striped with brown; belly and under surface of the wings white, transversely barred with brown; tarsi feathered to the lower third, each feather marked with five transverse bars, the rest shielded; the beak short, much hooked and sharp; claws and toes strong and formidable.

ACCIPITER BADIUS, *Gmel.* Brown's Sparrow Hawk.

Syn. Falco badius, *Gmelin.*
Falco Brownii, *Shaw.*
Falco Dussumieri, *Temm.*
Accipiter Dukkenensis, *Sykes.*

Dark rufous brown above, with pale edges to the feathers. Beneath white with brown drops. Wings darker brown on the upper surface; primaries white beneath and barred. Tail ashy and barred with black; lower tail coverts white. Thighs white and spotted slightly. (Young). In the adult, the breast is rufous and barred with white. Bill blue, tip black; irides yellow. Legs yellow. Length 14 inches.

This hawk is known in Ceylon as the "Sparrow Hawk." It is not an uncommon bird in the Kandyan hills and in the Northern Provinces.

ACCIPITER NISUS, *Linn.*

I had once a small live hawk sent from the Kandyan country, but which flew away before I had positively determined the species; it had a close resemblance to the European Sparrow Hawk. Mr. Layard says he has not seen this hawk in the Island. To enable others to identify this bird in Ceylon the following description from Stark's Elements of Natural History is here added:

"Bluish, cinereous above; a white spot on the neck; white beneath, with brown undulations; tail ashy grey, with five bars of blackish cinereous; cere yellowish green; feet and iris yellow. About 12 inches long."

SUB-FAM: CIRCINÆ.

CIRCUS SWAINSONII, *A. Smith.* Swainson's Hen-Harrier.

Syn. Circus pallidus, *Sykes.*
Circus albescens, *Lesson.*
Circus Dalmaticus, *Ruppel.*
Falco æquipar, *Cuv., M.S.*
Falco cyaneus, *var. A. Lesson.*

Pale ashy above; white beneath. Inner web of some of the primaries dark brown. Upper tail coverts white, with transverse ashy bars. Tail ashy, indistinctly barred; outer rectrices whitish speckled and barred with ash. Bill blackish. Tarsi and toes yellow; claws black. Length 1 foot 1 inch. Wing 1 foot 2 inches.

Generally found on the plains of the low country, and rarely in the Kandyan provinces. It feeds on small birds, frogs and lizards.

CIRCUS CINERASCENS, *Gould.* The Ashy Brown Harrier.

Syn. Falco cinerascens, *Mont.*
Circus Montagui, *Vieil.*

Ashy brown above. Under part of the neck and breast ashy, with rufous mesial streaks to the feathers of the latter. Abdomen, under surface of tail, lower wing and tail coverts white. Upper surface of tail rufous brown and broadly barred; tip white. Thighs white, streaked. Bill blackish; irides light yellow. Tarsi and toes yellow, claws black.

Length 1 foot 6 inches. Wing 13 inches.

Females are more or less of a rufous brown on the back; they have also a nuchal ring and broader black bars on the tail, and the whole of the abdomen of a light rufous colour. Head rufescent. In young birds the upper tail coverts are white. Probably the latter characters are also present when the bird is moulting. This species in its ashy plumage is not unlike the darker varieties of *Circus Swainsonii.*

The species is common in Kandy and Trincomalie. Reptiles and birds are its chief food.

CIRCUS MELANOLEUCOS, *Pennant.* The White and Black Indian Harrier.

I obtained several specimens of this bird from the open plains in Minery, none of which, however, I now have for description, and therefore give its characters from Latham's work.

"Length 16 inches; bill black; irides yellow; head, throat, hind part of neck, and back black; breast, belly, thighs, and rump white; lesser wing coverts white, the middle ones black; the greater and secondary quills silvery ash colour; prime quills black. Tail pale silvery grey; legs rufous.

The female is somewhat bigger; general colour silvery grey; on the wing coverts three round black spots, and three others on the outer webs of the second quills; primaries black; sides of the belly, thighs and vent white, transversely striated with rufous red."

Like the other species of Ceylon Harriers, it is reported to feed on birds, reptiles, and small rats and squirrels.

ORDER. ACCIPITRES.

SUB-ORDER. ACCIPITRES NOCTURNI.

Nocturnal Birds of Prey.

FAM: STRIGIDÆ.

SUB-FAM: SURNINÆ.

ATHENE CASTANOTUS, *Blyth.* Ceylon Chestnut-winged Hawk Owl.

Syn. Athene Castanopterus, *apud Blyth.*

Head, neck and breast barred with brown and rufescent white. A white spot under the ears. Back and wings bright chestnut and faintly barred with brown. Abdomen white, maculated with brown spots and streaks. Under wing coverts white, with a few brown spots. Vent and lower tail coverts white. Tail and upper tail coverts dark brown and streaked with narrow whitish bars. Thighs whitish and freckled with brown. Bill yellow. Tarsi yellow. Length 7½ inches. Wing 5 inches.

This Hawk-Owl was added to the Ceylon Fauna by Dr. Templeton. It feeds on small lizards and insects. Not uncommon at Colombo. I have also seen it at Newera Ellia, Galle and Kandy.

ATHENE SCUTELLATA, *Raffles.* The Hairy-legged Owl.

Syn. Ninox Nepalensis, *Hodgson.*
Strix scutellata, *Raffles.*
Strix hirsuta, *Temm.*
Strix lugubris, *Tickell.*
Athene Malayensis, *Eyton.*

Upper part of head and neck ashy brown; chin white. Back, scapularies and upper tail coverts rufous brown; dorsal feathers have palish edges and white spots. Primaries have brown above, with pale rufous bars, under surface white barred. Under wing coverts fulvescent and streaked with brown. Under surface of neck and breast rufous brown, with fulvescent white edges to the feathers. Abdomen white with large rufous brown spots. Tail dark ashy brown, with broad blackish bars; tip whitish. Upper tail coverts rufous brown and spotted white; under tail coverts white. Thighs rufous. Bill bluish black, with a yellowish culmen. Irides greenish yellow. Toes yellow, curved, with yellow bristly hairs. Claws black. Length 11 inches. Wing 5½ inches.

Not uncommon in the Cinnamon gardens at Colombo. Feeds on insects and lizards.

SUB-FAM: BUBONINÆ.

EPHIALTES LEMPIJII, *Horsf.* The Lempiji Owl.

Syn. Strix noctula, *Reinw.*
Scops Javanicus, *Lesson.*
Scops Lempiji, *Horsf.*

Brown spotted with fulvous and black. Breast and abdomen fulvous with blackish mesial streaks and inconspicuous bars and specks. Vent whitish. Outer web of primaries barred with light fulvous, inner web clouded dusky. Tail clouded with pale fulvous brown. Tarsi pale, freckled. Bill brown; irides reddish brown. Toes brown, claws brown.

Length 7½ inches. Wing 5¾ inches.

Some of the specimens are less fulvescent than others, and the blackish spots more numerous, and with a more distinct black patch on the top of the head.

This is the most common of all Ceylon Owls; less common, however, in the higher parts of the Islnad than in the Maritime provinces. It feeds chiefly on Coleopterous insects.

EPHIALTES SCOPS, *Linn.* The Scops Eared Owl.

Syn. Scops pennata, *Hodgson.*
Scops Aldrovandi, *Ray.*
Scops Europeus, *Lesson.*

Rufous brown, minutely speckled and streaked with dusky brown and rufous. Lower parts paler; abdomen, vent and lower tail coverts more white spotted; small white spots on the outer web of primaries; inner web of secondaries white barred. Tail barred and speckled with white and rufous. Bill brown. Irides yellow. Toes brown; claws dark brown.

Length 5½ inches. Wing 4 inches.

This elegant little owl is rare in Ceylon. I met with only one specimen (alive) at Trincomalie which Mr. Blyth has seen and identified with Scops Pennata, *Hodg.* Mr. Layard has not been so fortunate as to meet with this species, nor has he seen the next.

EPHIALTES SUNIA, *Hodgson.* The Yellowish Red Eared Owl.

Syn. Ephialtes scops, apud *Blyth.*

General colour, a bright ferruginous red, with black shafts to most of the plumage. It is less speckled and barred than *Scops pennata.* An albescent line on the scapularies, with black tips. Abdomen whitish yellow. Rather smaller than the last.

I have not seen this beautiful owl lower than Dimboola (4000 feet). It is not common. Mr. Layard has not met with it in Ceylon. The specimen I sent Mr. Blyth was identified by him with *Scops sunia* of Hodgson, which he still thinks is only a variety of *Ephialtes scops, Linn.*

KETUPA CEYLONENSIS, *Gmel.* The Large Eared Owl.

Syn. Strix Ceylonensis, *Gmel.*
Strix Leschenaultii, *Temm.*
Strix Hardwickii, *Gray.*
Strix dumeticola, *Tickell.*
Cultrunguis nigripes, *Hodgson.*

Above light ferruginous brown, with dark brown mesial streaks and pale spots on the dorsal feathers. Under part of neck whitish. Breast and abdomen light rufescent, minutely barred; each feather with a blackish longitudinal streak. Wing quills freckled and barred white and brown. Tail brown, with narrow ferruginous bars; tip rufescent. Bill blackish. Irides bright yellow. Length 1 foot 7 inches.

This large owl is very abundant in the Island, particularly in the Maritime provinces. It feeds on fish, rats, mice, &c.

SUB-FAM: SYRNINÆ.

SYRNIUM INDRANI, *Sykes?* The Devil Bird.

I have not seen this bird alive, though it is common enough in the forests. A specimen of this was many years ago in the Museum at Colombo. Above dark brown, barred. Abdomen whitish, barred. Toes densely covered with plumage. Irides yellow. Claws black. Length about 1 foot.

SUB-FAM: STRIGINÆ.

STRIX JAVANICA. *De Wormb?* The Yellow Barn Owl.

Syn. Strix flammeus, *var.*
Strix candida, *Tickell.*

Upper parts ochry yellow, speckled with grey, white and brown spots. Face white, margined with a rufous circle. Under parts yellowish white and spotted with brown. Inner web of primaries indistinctly barred. Tail speckled with dark grey, and slightly streaked. Thighs white. Bill horn colour. Irides pale yellow. Tarsi and toes yellowish brown; claws pale yellow. Length 1 foot 2½ inches. Wing 11 inches.

Found by Mr. Layard in the old Fort at Jaffna. The above description is taken from the only specimen he procured.

APPENDIX.

In order to keep the Ceylon student of Natural History up to other departments of Zoology, in addition to those which the Author is more particularly engaged in, it is his intention to republish in each part of the Prodromus now in progress of publication, the labours of Naturalists in Europe as they appear in periodical publications of the day. With this object in view, he has much pleasure in adding to this Part characters of new species of Land Shells (collected in Ceylon by Mr. Edgar Layard) from the pen of the celebrated Malacologist W. H. Benson, Esq., and also descriptions of a new species of Mungous by Dr. Gray.

From the Proceedings of the Zoological Society of London. Annals and Magazine of Natural History, No. 67, *July* 1853.

Notice of two VIVERRIDÆ from Ceylon, lately living in the Gardens. By J. E. GRAY, Esq., F.R.S., &c.

The specimens here noticed were brought from Ceylon by Alexander Grace, Esq., *(late Deputy Queen's Advocate, Southern Province).*

The first is the species which I described some years ago under the name of *Herpestes Smithii* (Mag. Nat. Hist. 1837, II.) from a specimen which was living in the Surrey Zoological Gardens, now preserved in the collection of the British Museum: that specimen was said to have been sent from the Cape of Good Hope, but this must have been a mistake, as it is quite unknown to Dr. Burchell, Dr. A. Smith, Mr. Sweet, Dr. Wahlberg, or other Zoologists who have written on the animals of South Africa. Mr. Grace informs me that it is an inhabitant of the interior part of Ceylon. It is by far the most beautiful species of the genus.*

The second is a new species of CYNICTES, which I propose to call CYNICTIS MACCARTHIÆ.

Teeth normal. Red brown; hair elongate, flaccid, pale brown, with a broad, black subterminal band, and a long whitish brown tip; of hands and feet shorter. Feet blackish brown, hair white tipped. Claws elongate, slender, compressed, especially of the two middle toes of the fore feet. Tail redder; hair elongate, one coloured red. Ears rounded, hairy.

Habitat. Ceylon; Jaffna, North of Ceylon, *(A. Grace, Esq.)*

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* This Mungous I have named in the Prodromus Faunæ Zeylanicæ, *Herpestes Rubiginosa,* and doubtfully cited *H. Smithii* of Gray as a Synonym. It is now clear that *H. Smithii* is a native of Ceylon, and not of Africa. I have found it common in the Northern and Southern Provinces of the Island.—E. F. K.

This species somewhat resembles *Cynictis Melanura* in general colour, but the hairs are much longer, not so adpressed, and when the individual colour of the hair is examined, most distinct.

I have proposed to name this interesting animal after Mrs. MacCarthy, the wife of the Secretary of the Colony, and the daughter of Mr. Hawes, the Assistant Secretary to the Colonies, who is much interested in the study of Natural History, and has kindly sent me several very interesting natural productions of Ceylon.

The skull differs from all the other Herpestes that I have examined, in the back of the nape being deeply and sharply notched instead of transversely truncated, the notch in the living animal being filled up with a cartilaginous septum.*

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* *Sed non vidi*, E. F. K.

vii.

Characters of new Land Shells, collected by EDGAR L. LAYARD, Esq., *in Ceylon.* By W. H. BENSON, Esq.

1. *Streptaxis Layardiana*, nobis.

Testa arcuato-rimata, depresso-ovata, abbreviata, lata, leviter striata, albido-cornea ; spira subelevata, apice planulato, excentrico ; sutura crenulata : anfractibus 5, convexiusculis, ultimo ad latus deviante, basi convexiuscula, lævi ; apertura straminea, subtriangulari uniplicata, marginibus callo lamellam intrantem validam emittente junctis, dextro expanso reflexiusculo, antrorsum arcuato, superne profunde sinuato, columellari et basali reflexis, umbilico intus rugoso-striato.

Diam. major 10½, minor 8, alt. 4 mill.

Hab. inter lapides ad verticem rupis Mehintali Insulæ Ceylon.

In one or two specimens the callus near the upper margin is inclined to form an obtuse tooth at the side of the sinus, which is much deeper than in *H. Perrotetiana*, Petit, from the Nilgherries.

A graphic account of the discovery is contained in Mr. Layard's Journal in page 235, vol. xi. of the 'Annals.' This and the following curious species, of a singular genus, capriciously distributed through the tropical regions of the globe, are the first which have been found in Ceylon. The head-quarters of the genus are in South America and Western Africa. The remaining species, of which the locality is known, are solitary in the Nilgherry Hills of South India, at Tavoy on the Tenasserim coast of the Bay of Bengal, in Cochin China, and in the Seychelles and Rodriguez, islands of the Southern Indian Ocean.

M. Petit de la Saussaye objects (Journ. de Conchyl. 1851, p. 369) to the reception of *Streptaxis* as a genus, considering it to be inadmissible in a zoological point of view; and he adduces as an argument for rejection the circumstance of its gradual change into *Helix*, through species which belong to the group, although deficient in the principal character of distortion. The same argument might be used against the reception of most other genera. *Bulimus* and *Achatina* have as little title to separation as this genus and *Helix;* and *Streptaxis* has equal claims to acceptance with Lamarck's genus *Anostoma*, like which the mollusk, to use M. Petit's words, "arriving at a certain stage of growth, abandons in the formation of the shell the regular course followed by the animals of the genus *Helix*."

The separation of such a singular group is, at all events, a great convenience in conchological research.

2. *Streptaxis Cingalensis*, nobis.

Testa arcuatim rimato-perforata, depresso-ovata, solida, abbreviata, lata, obsolete costulato-striata, albido-cornea, subtus polita; spira elevatiuscula, sutura crenulata, apice convexiusculo; anfractibus 6 convexis, ultimo ad latus deviante, basi convexa; apertura subtriangulari, 3-dentata, marginibus callo lamellam intrantem validam emittente junctis, dextro reflexo, antrorsum arcuato, unidentato, superne profunde sinuato, columellari reflexo, ad basin unidentato; umbilico intus striato, linea impressa circumscripto.

Diam. major 11, minor 8, alt. 5 mill.

Hab. in pago Hewagam Corle Insulæ Ceylon, inter rimas saxorum.

Nearly allied to the last, but differing in the dentition of the aperture, in the umbilicus, and in the less flattened form. The replication of the sinus at the top of the aperture simulates another tooth at right angles with the laminar plait on the parietes, a character observable also in *S. Perroteti*, and to which *S. Layardiana* also shews a tendency. It is intermediate between those two species in the dentition of the aperture, but wants the additional tooth which occurs at the base, within the aperture, in the first-named species, from which it is moreover much further removed in form than from *S. Layardiana.*

Mr. Layard has communicated the following note on the animal:—"Epiphragm glassy, animal yellow, with a red line on the back, extending up the two superior tentacles, at the tip of which the eyes are situated: all four tentacles clubbed; when crawling the shell is carried nearly level with the back."

The colouring of the animal reminds me of the hues observable in the *Pupæ* of the Isle of France, as well as in the Indian and Galle species, *P. bicolor* of Hutton. It has already been remarked by others that *Streptaxis* has an obvious affinity with the Mauritian *Pupa Pagoda* in the formation of the shell.

3. *Helix ceraria*, nobis.

Testa obtecte perforata, depressa, nitidula, cerea, radiatim rugoso-striata, striis spiralibus remotiusculis decussata, luteo-fulvida, versus apicem rubescente, spira convexiuscula, apice obtusato; anfractibus 4, superne planulatis, ultimo lato, carinato, subtus convexo; apertura magna, late lunata, peristomate simplici, acuto, marginibus callo tenuissimo junctis, columellari arcuato, superne breviter reflexo, perforationem inconspicuam fere tegente.

Diam. major 20, minor 16, alt. 10 mill.

Hab. in agris altis Insulæ Ceylon " Horton Plains " dictis.

4. *Helix Puteolus*, nobis.

Testa perspective umbilicata, orbiculato-depressa, lenticulari, supra spurca, albida, subremote radiato-lirata, subtus cornea, radiatim striata; spira planiuscula apice vix prominulo, sutura impressa; an-

fractibus 5½, angustissimis, convexiusculis, arcte convolutis, omnibus filoso-carinatis, superne sulco carinaque secunda parallelibus munitis, ultimo subtus planiusculo, ad marginem umbilici mediocris profunde excavati, cyathiformis, valde compresso; apertura angusta, securiformi, peristomate recto, acuto.
Diam. major 5½, minor 5, axis 2½ mill.
Hab. in saxis ad portas "Balcadua" dictas, Insulæ Ceylon.

This little shell is singular on account of its sculpture, the narrowness of the whorls, and the sudden and deep excavation of the well-like umbilicus. Vide 'Annals,' vol. vii. p. 305.

5. *Helix Mononema,* nobis.

Testa angustissime perforata, trochiformi, radiato-striata, corneo-albida, glabra, non nitida, translucente, spira conoidea, apice obtuso, sutura distincta; anfractibus 6½-7, superne convexiusculis, filo unico, elevato, tenui, mediano cinctis, ultimo acute filoso-carinato, subtus subplanulato; apertura verticali, securiformi, peristomate recto, acuto, margine, columellari brevi, verticali, reflexo, perforationem subtegente.
Diam. major 5, minor 4½, axis 4 mill.
Hab. ad Heneratgodde.

Allied to the Himalayan *H. fastigata,* Hutton, and to the Bengal *H. Barrackporensis,* Pfr., but well-distinguished by its more depressed form and by the filiform line, which in addition to the keel on the last whorl, runs along the central part of each of the upper whorls. Mr. Layard had not been able to procure a second specimen.

6. *Helix marcida,* nobis.

Testa subobtecte perforata, depressa, solida, superne oblique regulariter costulata, subtus læviori, sub epidermide fulvido-cornea albida; spira vix elevata, sutura impressa, apice obtusiusculo; anfractibus 6, lente accrescentibus, ultimo rotundato, subtus planulato, apertura sublate lunata, obliqua, peristomate recto, tenui, margine columellari oblique descendente, crassiusculo, superne breviter reflexo, perforationem subtegente.
Diam. major 14, minor 12, axis 8 mill.
Hab. in Insula Ceylon.

7. *Helix vilipensa,* nobis.

Testa aperte perforata, pervia, depressa, solidiuscula, pellucida, cornea, polita; spira convexiuscula, sutura vix marginata, apice obtuso; anfractibus 5, subplanatis, lente accrescentibus, ultimo rotundato, subtus convexiusculo; apertura late lunata, subobliqua, peristomate recto, acuto, margine columellari oblique descendente, expansiusculo, superne breviter reflexo; umbilico pervio.
Diam. major 8, minor 7, axis 4 mill.
Hab. ad rupem Mehintali.

A little Naninæform *Helix* with no very prominent character, differing from Pfeiffer's *H. Perroteti,* and other small Helices of the same group, with the exception of a small un-

named Nilgherry shell which is slightly larger, but otherwise not easily to be distinguished from it. From *H. Perroteti* it differs by its more convex spire, rounder periphery, and more open perforation.

8. *Helix perfucata*, nobis.

Testa vix perforata, depressa, translucente, purpureo-fusca, politissima, spira elevatiuscula, sutura submarginata, apice obtuso; anfractibus 4, convexiusculis, arcte convolutis, ultimo rotundato, subtus convexo; apertura lunata, vix obliqua; peristomate recto, acuto, margine columellari verticali, leviter reflexo, umbilico non pervio.
Diam. major 5, minor 4, axis 3 mill.
Hab. in pago Gallensi, inter saxa.

Remarkable for its deep clear purple-brown colour.

9. *Vitrina Edgariana*, nobis.

Testa valde depressa, tenuissima, subtus membranacea, politissima, pellucida, superne obsolete oblique striatula, lineis nonnullis spiralibus impressis ornata, lutescente-cornea; spira planiuscula, apice prominulo, sutura impressa; anfractibus 3 celeriter accrescentibus, planiusculis, ultimo ad periphæriam valde convexo; apertura obliqua, ovato-lunata.
Diam. major 10, minor 8, alt. 4 mill.
Hab. ad Columbo, Hangwelle, et Ratnapoora, insuper folia arbustorum.

Mr. E. Layard remarks, that "the mollusk is very long and attenuated, yellow and white. On touching it, it throws itself off the spot where it crawls, and twists and springs about in a most singular manner, often propelling itself several inches from its starting point." I have recorded elsewhere a similar habit in a little freshwater shell, *Planorbis rotula*, nobis.

10. *Vitrina membranacea*, nobis.

Testa valde depressa, submembranacea, obsolete oblique striatula, striis versus apicem confertissimis pellucida, virente-cornea, polita, superne convexiuscula, apice planato, sutura vix marginata; anfractibus 3½, rapide accrescentibus, ultimo antice lato, subtus planulato, ad periphæriam angustam rotundato; apertura obliqua, ovata, margine superiori prorsus arcuato.
Diam. major 11, minor 8, alt. 4 mill.
Hab. ad portas montanas Balcadua dictas, lapidibus adhærens.

11. *Achatina Veruina*, nobis.

Testa cylindraceo-turrita, valde elongata, sordide albida, inæqualiter striata, spira superne sensim attenuata, sutura impressa, crenulata, apice obtuso; anfractibus 12½-13 angustis cylindricis, ultimo $\frac{2}{11}$ longitudinis vix æquante; apertura verticali, truncato-ovali, peristomate recto, acuto, margine columellari leviter arcuato.
Long. 25, diam. 5 mill.
Hab. ad Nalande.

12. *Achatina pachycheila,* nobis.

Testa ovato-oblonga, striatula, striis exilissimis confertis, obsoletis, spiraliter sub lente decussata, nitida fuscescente-cornea, translucente, spira elongata, subconica, apice obtuso, sutura leviter impressa; anfractibus 6, vix convexiusculis, ultimo $\frac{2}{5}$ longitudinis vix æquante; apertura verticali, oblongo-ovata, peristomate intus albido-marginata, columella præarcuata, margine basali incrassato.
Axis 11, diam. 5 mill.
Hab. ad Heneratgodde.

This little species of a group, which has so many representatives in Ceylon, the Nilgherries, and the damp woody mountains of North-eastern India, with a more slender form than *A. Oreas,* nobis, is well distinguished from the allied forms by its peculiar sculpture under the lens, and by the internal incrassation of the peristome, a feature which is also observable in the species *A. crassilabris,* nobis, from North-eastern India.

13. *Bulimus Panos,* nobis.

Testa rimata, ovato-oblonga, subrugose striata, cornea, spira elongato-conica, sutura mediocri, apice obtuso; anfractibus 6½ convexiusculis, ultimo $\frac{2}{5}$ longitudinis vix æquante, antice subascendente, apertura ovata, edentula; peristomate expansiusculo, acuto, marginibus conniventibus, columellari breviter dilatato, albido.
Long. 11, diam. 5 mill.
Hab. ad Nalande.

This shell has a Pupiform aspect.

14. *Pupa Muscerda,* nobis.

Testa rimata, ovato-oblonga, striatula, cornea, spira elongata, apice obtuso; anfractibus 5½-6, convexiusculis, ultimo tertiam partem testæ æquante, vix ascendente; apertura ovata, tridentata, peristomate expanso, acuto, marginibus conniventibus, columellari dilatato, albido, plica parietali 1, columellari 1, profundiusculis, dente palatali 1, depresso, obtuso.
Long. 4, diam. 1½ mill.
Hab. ad promontorium "Pedro" dictum.

Found by Mr. E. Layard in old posts, and on Palmyra trees (*Borassus flabelliformis*).

15. *Pupa Mimula,* nobis.

Testa rimata, ovato-oblonga, subcylindracea, oblique tenuiter plicatula, pallide cornea, apice obtuso, sutura profundiuscula; anfractibus 5, convexis, ultimo vix ascendente; apertura ovata, verticali, 5-plicata, peristomate tenui, expanso, marginibus callo tenui expanso junctis, plica 1 intrante, majuscula, parietali, 1 columellari, 1 basali profunda, 2 palatalibus profundis.
Long. 2, diam. 1 mill.
Hab. in vitibus ad Promontorium Pedronis.

A minute species nearly allied to, and somewhat larger than the Himalayan *P. Huttoniana,* nobis. It was taken in abundance by Mr. Layard.

16. *Cataulus Austenianus,* nobis.

Testa subperforata, ovato-pyramidata, solidiuscula, eleganter oblique costulato-striata, sericea, diaphana, saturate rubro-castanea, spira turrita, sutura impressa, apice acutiusculo; anfractibus 8, convexiusculis, ultimo antice subascendente, carina basali, compressa, prominente, subfuniculata, antice non dilatata; apertura subcirculari, obliqua, sursum spectante, peristomate duplici, incrassato, saturate fusco-aurantiaco, interno continuo, breviter adnato, externo fornicatim patente reflexo, superne et ad columellam subauriculato-dilatato, canali basali aperto, intus vix strictiore, ad sinistram perforato; operculo spiraliter laminato, anfractus multos appressos reconditos exhibente, facie exteriori anfractos plures angustos mentiente.

Diam. 13½, alt. 25 mill.

Hab. ad Heneratgodde in rimis saxorum.

Allied in form and size to *Cataulus pyramidatus,* Pfeiffer, but differs in sculpture, position of the canal, colour of aperture, &c. It was taken by Mr. Edgar L. Layard in the deep fissure of a limestone rock, among the vegetable mould, where it lay concealed under the surface, with the mouth downwards, among the roots of an ancient *Ficus Indica.* In some specimens the last whorl is more swollen than in others.

Mr. Layard has communicated the following description of the animal in a letter written on the spot:—

"The animal is dark brown, mottled, about 9 lines long, 5 broad; tentacles two, brilliant scarlet tipped with brown, 3 lines long, sharp pointed; eyes two, black, situated at the outside of the tentacles. The mollusk is very slow in its motions, crawling with the shell plane over its back, resting on the operculum; this is round and fits into the mouth; it is retractile when the animal is much irritated, but does not close the siphon and canal; when crawling, the flesh of the mollusk does not touch the canal. After placing them in boiling water to clean, I thrust a needle into one and pierced the operculum accidentally; judge of my astonishment, when in attempting to withdraw the instrument, the operculum unfolded revolution after revolution till I counted nine!" Subsequently Mr. Layard counted nineteen whorls in one operculum; and he has aptly likened it to the horn toy, made to resemble a snake by slicing it spirally from end to end, so as form a laminar centreless screw.

At the request of the discoverer, I have much pleasure in dedicating the species to his brother, the enterprising Oriental archæologist and traveller Dr. Austen Layard.

17. *Cataulus decorus*, nobis.

Testa subperforata, elongato-turrita, solida, confertim costulato-striata, nitidiuscula, rufo-castanea, apice acutiusculo; anfractibus 8, convexiusculis, ultimo ad basin compresso-carinato, carina valde prominente versus marginem funiculata, incrassata, antice vix dilatata; apertura verticali, circulari, peristomate incrassato, reflexo, breviter adnato, læte aurantiaco, ad basin subproducto, deorsum recedente; canali extus lato perforato; periomphalo magno: operculo ut in præcedente.

Diam. vix 10, axis 21 mill.

Hab. ad Ratnapoora.

Mr. Layard wrote regarding this species—"This was found under a rock with two others; animal brownish gray, foot livid. Tentacles pale orange, two; eyes sessile, two, black."

Mr. Layard has, since his return to England, detected in the operculum of *Megalomastoma altum* a structure similar to that which obtains in these *Catauli*, and I have, since the communication of that circumstance, also observed it in the operculum of the Himalayan *Meg. funiculatum*, nobis.

18. *Cyclophorus Parapsis*, nobis.

Testa late et perspective umbilicata orbiculato-depressa, tenui, confertim striatula, olivacea, sub epidermide tenui albida; spira planiuscula, apice vix prominulo, sutura profunda; anfractibus 4 convexiusculis, ultimo cylindrico, leviter descendente, non dilatato; apertura subverticali, subcirculari, intus glaucescente; peristomate continuo, breviter adnato, recto, simplice, acuto: operculo tenui, corneo, arcte spirato, medio concaviusculo, intus obtuse umbonali.

Diam. major 13, minor 10, alt. 5 mill.

Hab. ad Damboul, ad verticem rupis, in rimis saxorum.

It differs from *C. loxostoma*, Pfeiffer (a large and handsomely marked variety of which was found on the same rock), in colouring, epidermis, depth of suture, narrower and deeper umbilicus, and the more circular and vertical aperture, which exhibits nothing of the diagonal departure from the axis observable in Pfeiffer's shell. The peristome also is acute and single, instead of being double, slightly expanded and thickened, as in that species, of which Mr. Layard's specimen is variegated with radiate and undulated chestnut stripes, and with a single band on a fulvous ground.

Annals and Magazine of Natural History, Vol. xii. *p.* 90.